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Cost and Effectiveness Analysis of LINKAGES' Infant and Young Child Feeding Program in Madagascar

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Abstract

This study analyzes the cost effectiveness of an infant and young child feeding program implemented by LINKAGES (a USAID-funded cooperative agreement managed by the Academy for Educational Development) and its partners – the Ministry of Health and Jereo Salama Isika project – in Madagascar. The indicators used to measure effectiveness are: 1) exclusive breastfeeding (EBF); 2) timely initiation of breastfeeding (TBF); 3) use of Lactational Amenorrhea as a method of family planning (LAM); 4) complementary feeding (CF); 5) increased frequency of breastfeeding for sick children (FSC); and, 6) increased eating for breastfeeding women (MN). The key findings are: 1) There is a positive relationship between the costs incurred per beneficiary and the behavior change outcomes; 2) The cost of training and mass media activities are the key cost drivers; 3) The cost of replicating the package of activities to promote EBF, TIBF, and LAM is $6.23 per targeted child, while the cost per new EBF, TIBF, and LAM acceptor are $10.09, $2.33 and $4.44, respectively; 4) LINKAGES may be able to increase its cost effectiveness by selecting areas with large target populations and low rates of the targeted behaviors; and, 5)LINKAGES' program in Madagascar appears to be cost effective with an average cost per new EBF acceptor of $10, compared with data from Ghana and Brazil showing cost per new EBF acceptor to be $34 and $59, respectively. Further work to study the economies of scale and scope for these types of interventions, as well as their sustainability or longevity, would be helpful to improving cost effectiveness.

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Acronyms

AAPS	Appui aux Activities de Promotion de Sante (Support for Health Promotion Activities)
BCC	Behavior Change Communication Program
EBF	Exclusive breastfeeding
CF	Complementary feeding
DALY	Disability Adjusted Life Year
DHMT	District Health Management Team
FSC	Feeding of a sick child
GAIN	Groupe d'Action Intersectoriel pour la Nutrition (Intersectoral Action Group for Nutrition)
GF	Groupement Feminin (Women's group)
IMCI	Integrated Management of Childhood Illnesses
JSI	Jereo Salama Isika Project
LAM	Lactational Amenorrhea Method (LAM)
MOH	Ministry of Health
MN	Maternal nutrition
NGO	Non-governmental organization
RA	Rapid Assessment
TIBF	Timely initiation of breastfeeding
USAID	United States Agency for International Development

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Executive Summary

Introduction

LINKAGES, a USAID-funded cooperative agreement, has been working to improve the health and nutritional status of women and children in Madagascar since 1997. From 1997-1999, LINKAGES' program in Madagascar focused on providing support to the Ministry of Health for national nutrition policy activities. In 1999, LINKAGES' focus expanded to include the implementation of a behavior change strategy at the district and community level to promote key nutrition behaviors related to infant and young child feeding, maternal dietary practices, and to extend the offering of the Lactational Amenorrhea Method (LAM) as one of the modern family planning methods.

The cornerstone of LINKAGES' program is an integrated, community-based approach to behavior change that targets health providers, community leaders and volunteers, and household members. This study focuses on the promotion of infant and young child feeding behaviors at the community level. LINKAGES promotes appropriate behaviors by providing training, educational materials, and technical assistance to its partners, who have ongoing activities at the community level. LINKAGES facilitates and enables its partners, who have community level networks, to promote appropriate infant feeding and maternal nutrition. LINKAGES' key partners in Madagascar include the Ministry of Health, Jereo Salama Isika (JSI) Project, non-governmental organizations (NGO), and community leaders and volunteers.

While LINKAGES has been successful in increasing target behaviors in several countries, USAID and other stakeholders are increasingly interested in understanding the cost of its interventions relative to results. LINKAGES asked Abt Associates to conduct a cost and effectiveness analysis of LINKAGES' infant and young child feeding, and maternal nutrition promotion activities in Madagascar. This study represents the second of a three-study series that will provide complementary and comparative results on the cost effectiveness of LINKAGES' interventions in select countries. A study of the cost-effectiveness of LINKAGES' program in Ghana was completed in December 2003 and a study of the LINKAGES/Zambia program is underway and will be completed in 2004.

The specific objectives of this study are:

- to analyze the cost effectiveness of LINKAGES' infant and young child feeding activities in Madagascar from January 2000 – October 2001;
- to determine the cost implications of replicating these activities in other districts in Madagascar.

The specific questions addressed in this study are:

- How do costs and outcomes compare across study regions?
- What are the determinants of costs and cost effectiveness across the study regions?
- What would it cost to replicate these activities in new districts and is it cost effective?
- How can LINKAGES improve its cost effectiveness?
- How does the cost effectiveness of the interventions in Madagascar compare with other infant and young child feeding interventions?

Methodology and Data Collection

The study bases its analysis on costs incurred between January 2000 through October 2001, coinciding with the dates of a baseline survey of Essential Nutrition Actions and a rapid assessment of LINKAGES' community level activities, respectively, which provide outcome data. At the request of LINKAGES, this study focuses on six indicators to measure the effectiveness of LINKAGES' behavior change strategy:

1. Exclusive breastfeeding rate of infants 0–6 months of age (EBF)
2. Timely initiation of breastfeeding rate (TIBF)
3. Proportion of breastfeeding women with children 0-5 months that use LAM as a method of family planning (LAM)
4. Complementary feeding rate of children 6–23 months of age (CF)
5. Increased frequency of breastfeeding during illness of children 0-23 months of age (FSC)
6. Proportion of breastfeeding women with children aged 0-11 months of age who are eating more than usual (MN)

The full cost of LINKAGES/Madagascar activities that support the promotion of targeted behaviors, including allocation of all overhead/fixed costs associated with the Madagascar central and district-level offices, is included in the analysis. Direct costs of the LINKAGES DC office associated with nutrition promotion activities in Madagascar are also included. Indirect costs of the LINKAGES DC office are excluded. The direct costs of JSI and MOH partners are included, but overhead costs are always excluded because infant and young child feeding/maternal nutrition promotion represents a very small portion of overall activities and has minimal impact on fixed costs. Household and volunteer costs are not included in this study.

Once all the costs are compiled, costs are allocated to achieving behavior change by allocating costs to the full set of LINKAGES/Madagascar activities, a subset of which target community level behavior change and are included in this study. Costs for the subset of activities are then allocated to the two regions in which LINKAGES worked. Lastly, costs for each of the activities in the two regions are allocated to the behaviors targeted.

The key indicator used throughout this study to measure cost effectiveness is the total cost per new acceptor for each of the target behaviors (EBF, TIBF, LAM, CF, FSC, MN). Two other indicators used are the cost per targeted child, defined as target population for each of the behaviors, and the cost per beneficiary, defined as the total population of the target area. The number of new acceptors is calculated by multiplying change in the rate of the targeted behavior (e.g., the EBF rate) by the total number of children targeted over the period. For example, the cost per new EBF acceptor, the indicator of the cost effectiveness of promoting EBF in each district, is expressed in the following formula:

$$\frac{\text{[cost of activities to promote EBF]}}{\text{[target population]} * (\text{[EBF rate-RA 2001]} - \text{[EBF rate-baseline]})}$$

The methodology used in this study was initially developed for a similar cost-effectiveness study of LINKAGES the program in Ghana. The same methodology is used for this study in Madagascar and will be used in a third study in Zambia in order to provide complementary and comparative results.

Findings by Specific Research Question

1. How do costs and outcomes compare across study regions?

There is a positive relationship between the costs incurred per beneficiary and the behavior change outcomes. Increases in the targeted behaviors were generally higher in Fianarantsoa region (cost per beneficiary $0.89) than in Antananarivo (cost per beneficiary $0.61).

Table ES1: Relationship Between Costs and Outcomes (LINKAGES and Partner Costs)

	Antananarivo			Fianarantsoa		
Number of Beneficiaries	**886,291**			**448,906**		
Indicator	**Cost**	**Per Beneficiary**	**Pct Chg in Indicator**	**Cost**	**Per Beneficiary**	**Pct Chg in Indicator**
EBF	214,971	**0.24**	38%	177,541	**0.40**	36%
TIBF	40,310	**0.05**	21%	33,436	**0.07**	54%
LAM	105,510	**0.12**	29%	75,903	**0.17**	58%
CF	118,999	**0.13**	30%	64,536	**0.14**	49%
FSC	46,722	**0.05**	14%	36,975	**0.08**	15%
MN	17,386	**0.02**	73%	10,230	**0.02**	51%
TOTAL	**$543,898**	**$0.61**		**$398,621**	**$0.89**	

2. What are the determinants of costs and cost effectiveness across the study regions?

The cost of training activities and mass media are the key cost drivers, and explain the largest differences in the cost structure between the two regions. Overall, training costs were higher in Fianarantsoa, and a larger proportion of costs were spent on health technician training, while Antananarivo devoted a much larger percentage of its training costs to training a network of private practice doctors. On a per beneficiary basis, mass media costs in Fianarantsoa ($0.12) were more than twice that of Antananarivo ($0.05).

As the level of partner participation was similar in the two regions, and given the limitations of financial data, partner participation was not found to be a major factor in determining cost effectiveness. The relationship between the size of the target population and cost effectiveness is not completely clear – activities in Antananarivo were not clearly more cost effective even though it has a target population roughly twice that of Fianarantsoa. It may be that economies of scale are not great for behavior change and that higher spending or different or more activity is required to achieve behavior change in a much larger population. That is, there is not great savings to be realized from targeting a large population because the scale of activities would need to be increased significantly. Another explanation is that economies of scale continue only to a certain threshold population, after which no further economies can be realized – and the target population in Antananarivo exceeds that threshold. Determining that threshold, and thus the population level at which additional activities are needed, would be a key factor to improving the cost effectiveness of future interventions. The data is mixed on whether the baseline rate of the targeted behavior impacts cost effectiveness.

3. What would it cost to replicate these activities in new districts and is it cost effective?

To calculate the cost of replication in Madagascar, only the costs of implementation activities are included (start-up costs would not be incurred again, and evaluation costs do not produce behavior change and are not included in comparable studies). The cost of replicating LINKAGES and partner activities to promote EBF, TIBF, and LAM is $6.23 per targeted child. The cost per beneficiary for this set of activities is $0.37. For the complete package of LINKAGES' activities aimed at improving all six indicators, the cost per beneficiary is $0.56. The costs per new EBF, TIBF, and LAM acceptor are $10.09, $2.33 and $4.44, respectively.

Table ES2: Costs of Replicating EBF, TIBF, and LAM Promotion Activities, LINKAGES and Partner Implementation Costs Only

	Antananarivo	Fianarantsoa	Total
Total Costs of EBF, TIBF, and LAM Promotion (US$)	**$276,080**	**$219,112**	**$495,192**
Target Population	52,859	26,594	79,453
Cost per Child (US$)	**$5.22**	**$8.24**	**$6.23**
Total Beneficiaries	886,291	448,906	1,335,197
Cost per Beneficiary (US$)	**$0.31**	**$0.49**	**$0.37**
Total Costs of Promoting ALL Targeted Behaviors (US$)	**$434,206**	**$310,868**	**$745,074**
Cost per Beneficiary	**$0.49**	**$0.69**	**$0.56**

4. How can LINKAGES improve its cost effectiveness?

While the baseline rate of the targeted behavior or the size of the target population by itself does not explain the differences in cost effectiveness, together with the behavior outcomes, these factors do impact cost effectiveness. For indicators where the baseline and outcome behavior rates were similar in the two regions (EBF, FSC), the size of the target population did drive cost effectiveness. For other indicators (TIBF), Fianarantsoa's much lower baseline rate together with a significantly higher outcome rate, more than offset the lower target population in Antananarivo.

LINKAGES may be able to improve its cost effectiveness by selecting areas with large target populations and low rates of the targeted behaviors. More data and further analysis of the impact of the mix of activities, and the economies of scale associated with this type of behavior change is needed to better inform cost effective program design.

5. How does the cost effectiveness of the interventions in Madagascar compare with other infant and young child feeding interventions?

Other cost effectiveness studies of infant and young child feeding interventions are limited. The two studies used for comparison are a sister study of LINKAGES' interventions in Ghana and a study conducted in Brazil (funded through the USAID LAC-HNS project), both of which focus on breastfeeding promotion. It is difficult to compare Madagascar, with a mix of urban and rural intervention areas with Ghana, where the intervention areas are remote and sparsely populated, with

Brazil where the interventions were in hospitals in urban settings. Despite these differences, some comparison is useful. After adjustments for comparability, LINKAGES' interventions in Madagascar appear to be cost effective at an average cost per new EBF acceptor of $10, compared with data from Brazil showing cost per new EBF acceptor to be $59, and data from Ghana showing cost per new acceptor to be $34.

Discussion and Conclusions

While this study provided data that will be useful in shaping future activities, there are nonetheless many other important questions that could contribute to shaping future activities, that have not been addressed:

- What is the impact of each of the individual activities?
- What is the optimal mix of activities?
- What is the level of input required for specific activities, given program parameters such as target population, population density?
- How does the scale and scope of the program impact cost effectiveness?
- How sustainable is the behavior change?

Although LINKAGES appears to be cost effective, without more information on the optimal mix of activities, we cannot determine how LINKAGES can be *most* cost effective, by determining the most cost effective activities or mix of activities. Based on data from Madagascar and Ghana, there do appear to be economies of scale and scope. That is, both the size of the program or the size of the population covered (scale), and the range of the behaviors targeted (scope) positively impact cost effectiveness. However, it also appears that economies of scale diminish beyond a certain threshold of population size. Further research to determine that threshold and to explore the activities required beyond that threshold would be helpful to improving cost effectiveness. Lastly, the sustainability or longevity of LINKAGES interventions is a key question affecting cost effectiveness. This study does not measure ongoing behavior change beyond the period of the intervention, nor does it measure the interventions' input toward establishing the targeted behaviors as self-sustainable cultural norms.

Comparative work to explore thoroughly the factors that create differences in cost effectiveness between LINKAGES' interventions in Ghana and Madagascar will inform future program design – this work is expected to be completed in 2004. A follow-on study using data from the period November 2001 to October 2002 is under consideration, which could inform the sustainability and longevity questions as that was a period when LINKAGES activities were largely scaled back.

1. Background to the Study

The LINKAGES Project, implemented by the Academy for Education Development under a USAID-funded cooperative agreement, has been operating in Madagascar since 1997. From 1997-1999, the LINKAGES/Madagascar program focused on providing support to the Ministry of Health (MOH) to develop and strengthen national nutrition policy activities. In 1999, LINKAGES' focus expanded to include the implementation of a behavior change strategy at the district and community level to promote key nutrition behaviors related to infant and young child feeding, maternal dietary practices, and to extend the offering of the Lactational Amenorrhea Method (LAM) as one of the modern family planning methods.

LINKAGES is committed to making significant improvements in the health and nutritional status of Malagasy women and children. The program aims to achieve improvements in nutrition practices as measured by the following seven key indicators:

1. Exclusive breastfeeding among women with infants less than 6 months of age
2. Initiation of breastfeeding within the first hour of birth
3. Breastfeeding women with children 0-5 months that use LAM as a method of family planning
4. Complementary feeding among children 6–23 months of age
5. Increased frequency of breastfeeding during illness of children 0-23 months of age
6. Increased eating by breastfeeding women with children aged 0-11 months of age
7. Control of Vitamin A deficiency, anemia, and iodine deficiency

LINKAGES uses a combination of strategies to improve infant and young child feeding, and maternal nutrition practices. These strategies include collaboration with MOH partners, nongovernmental organizations (NGOs), private sector health providers, and community groups/leaders to implement community level behavior change interventions, advocacy and information dissemination on the national policymaking level, and curricula reform for health workers and students. This study focuses on the first strategy: the promotion of improved nutrition behaviors at the community level.

LINKAGES provides training, materials, and technical assistance to enable MOH, NGO, private sector, and community-level partners to promote and support essential nutrition actions. These partners have an established presence and network within the communities, and most conduct health promotion activities as part of their ongoing activities as health workers or community leaders and volunteers. LINKAGES' interventions enable the partners to promote nutrition-related practices more effectively within their ongoing program of activities.

While LINKAGES has been successful in increasing target behaviors, USAID and other stakeholders are increasingly interested in the cost of these interventions relative to results. LINKAGES requested Abt Associates to conduct a cost and effectiveness analysis of LINKAGES' breastfeeding and maternal nutrition promotion activities in Madagascar. This study represents the second of a three-study series that will provide complementary and comparative results on the cost effectiveness of LINKAGES' interventions in select countries. A study of the cost-effectivness of LINKAGES' program in Ghana was completed in December 2002 and a study of the LINKAGES/Zambia program is underway and will be completed in 2004.

2. Objectives of the Study

This study was conducted to provide information to USAID and LINKAGES' in-country partners on the costs and cost-effectiveness of the LINKAGES' program in Madagascar. The objectives of this study are:

- to analyze the cost-effectiveness of LINKAGES' nutrition promotion activities in Madagascar from January 2000 – October 2001; and
- to determine the cost implications of replicating these activities in other districts in Madagascar.

Because of the dual objectives and different audiences for this study, data are presented in many different ways. For example, USAID may be more interested in the cost effectiveness of its funding through LINKAGES, while the Malagasy MOH may wish to see the total costs borne by various levels of the health system. Depending on their objectives, different readers will be interested in analysis performed in somewhat different ways. While all the data analysis adheres to the methodology described in Section 4, costs are disaggregated in various ways to answer different questions. The specific questions of interest are:

- How do costs and outcomes compare across the regions in which LINKAGES is working?
- What are the determinants of costs and cost effectiveness across the regions?
- What would it cost to replicate these activities throughout Madagascar and is it cost effective?
- How can LINKAGES improve its cost effectiveness?
- How does the cost effectiveness of the interventions in Madagascar compare with other infant and young child feeding interventions in that country and elsewhere?

As detailed in the findings section, the data collected aimed to answer these questions, but drawing conclusions in other areas will require further study.

3. Description of LINKAGES and Partner Activities

LINKAGES has been working in Madagascar since 1997 to promote improvements in the health and nutritional status of women and children. LINKAGES' activities in Madagascar focused on national nutrition policy activities until 1999, when its focus expanded to include district-level activities in 10 health districts in the regions of Antananarivo and Fianarantsoa. In 2001, the LINKAGES' program was further expanded to include thirteen additional districts in these two regions.

In its work at the national policy and district level, LINKAGES' program in Madagascar employs five key strategies:

- ***Policy and advocacy*** – including coordinating intersectoral nutrition workshops, promotion of key behaviors through mass media, and creation of supportive environments for breastfeeding in hospitals and workplaces.
- ***Partnerships*** – LINKAGES forms strategic alliances with technical and programmatic partners who have complementary skills and geographic coverage. Key partners include Ministry of Health, JSI, NGOs, community-based organizations, and community leaders.
- ***Capacity Building*** – LINKAGES supports training of MOH and private health providers, NGOs, community-based organizations, and community volunteers and leaders to improve their capacity to encourage women to adopt appropriate nutrition behaviors.
- ***Community mobilization and behavior change communication*** – To promote key practices, LINKAGES improves interpersonal communication skills of health workers and local health promoters, and supports community discussions and events.
- ***Monitoring and evaluation*** – to assess changes in infant and child feeding practices, LINKAGES uses rapid assessments to measure changes in key practices.

LINKAGES' activities aim to promote improved infant and young child feeding and maternal nutrition practices through a community-based behavior change strategy that targets health providers, community leaders and volunteers, and household members. LINKAGES' community approach is based on the Integrated Management of Childhood Illness (IMCI) strategy adopted by the Ministry of Health and other key partners. Its approach includes training, community mobilization, mass media, and Information, Education and Communication (IE&C) to promote key nutrition behaviors. The key behaviors include:

- Timely initiation of breastfeeding within 1 hour of birth
- Exclusive breastfeeding for the first 6 months of life
- Use of LAM as a modern family planning method
- Complementary feeding of infants
- Increased frequency of breastfeeding during illness of a child
- Maternal nutrition – including increased eating by breastfeeding women
- Control of Vitamin A deficiency, anemia, and iodine deficiency

To implement its community-based behavior change strategy, LINKAGES partnered with Jereo Salama Isika (JSI), a USAID-funded bilateral child survival and reproductive health project. In the initial phase of implementation, LINKAGES and JSI formed two-person teams of health technicians

in ten health districts in the regions of Antananarivo and Fianarantsoa. In 2001, new JSI/LINKAGES teams were placed in thirteen additional districts. The LINKAGES and JSI technicians provide coordinated and complementary support to district MOH personnel to strengthen their training and supervision of health workers and community volunteers. Whereas LINKAGES technicians focus on organizing and strengthening activities to promote key nutrition behaviors, JSI technicians support activities related to family planning, reproductive health, immunizations, and IMCI. One area of overlap is the promotion of breastfeeding and LAM.

3.1. LINKAGES Activities during the study period

This study focuses on LINKAGES' activities in Madagascar from January 2000 – October 2001. During this period, LINKAGES continued to participate in national policy activities as an active member of the national coordinating body for nutrition activities entitled *GAIN* (Intersectoral Action Group for Nutrition). However, the bulk of LINKAGES' activities related to the implementation of its community-based behavior change strategy in the ten initial health districts in Antananarivo and Fianarantsoa regions.[1] LINKAGES facilitates and enables its partners, who have community level networks, to promote improved nutrition behaviors.

At the district-level, LINKAGES' core activities during the study period included workshops to train trainers among MOH and NGO partner organizations. These trainers then trained public and private health providers and community volunteers in nutrition and effective Behavior Change Communication (BCC) methods. In addition, LINKAGES health technicians provided on-going technical assistance to District Health Management Teams (DHMT) to plan and organize new trainings, education activities, and supervisions for health workers and community volunteers.

At the community-level, LINKAGES organized and implemented trainings for community leaders and volunteers and women's groups. Community volunteers and women's groups then worked within their community to assist women in adopting infant and young child feeding and maternal nutrition practices. As part of its training activities, LINKAGES provided and trained partners in the use of IEC materials, such as counseling and health cards and "Gazety" health education pamphlets.

The focus of LINKAGES' district and community-level activities changed over the study period as new training modules were introduced in the health districts. LINKAGES uses three nutrition training modules for health workers and communities: (1) breastfeeding and LAM; (2) complementary feeding and feeding of a sick child; and (3) women's nutrition and micronutrients. In 2000, LINKAGES training and related activities, including IEC and mass media, focused on breastfeeding and LAM. In 2001, the second nutrition training module was introduced and the focus of training and other activities expanded to include complementary feeding and feeding of a sick child. By the end of the study period, the third training module had been introduced in a few districts. All of the training modules touched on increased intake of Vitamin A and maternal nutrition.

In addition to district and community-based activities, LINKAGES also conducted monitoring and evaluation activities during the study period. The main activities of this type are the baseline

[1] From July - October 2001, LINKAGES was in the process of expanding its program to 13 new districts, which are not included in this study.

household survey of essential nutrition actions conducted in January 2000 and two rapid assessments of LINKAGES' and JSI's behavior change strategies in October 2000 and October 2001. These studies were collaborative efforts between the MOH, LINKAGES, and JSI.

3.2. Partner Activities

As mentioned above, LINKAGES relies on its partners' networks in the communities to promote targeted behaviors at the community level. During the study period, LINKAGES worked closely with the MOH, JSI, NGOs, and community leaders and volunteers in each of the ten target districts in the regions of Antananarivo and Fianarantsoa. While nutrition promotion has become important parts of all the partner activities (as a result of LINKAGES), they are only small part of partners' overall program of activities. LINKAGES and its partners align their activities to support their common objectives. For example LINKAGES conducts training for partner staff, but the partners then conduct training for community level health staff and volunteers.

3.2.1. Jereo Salama Isika (JSI) Project

The JSI project was started in 1999 as Phase 2 (1999-2003) of USAID's bilateral health program in Madagascar. It was designed to be an integrated child survival, reproductive health and nutrition program with a community mobilization approach. The JSI Project included many components, including reproductive health and family planning, STI/HIV/AIDS prevention, immunizations, IMCI, and nutrition. The overlapping focus of LINKAGES' and JSI's program on child survival and nutrition enabled a collaborative and synergistic approach to training and community mobilization activities, IEC materials, and mass media messages. LINKAGES' presence enhanced the nutrition component of JSI's activities, and breastfeeding and other nutrition behaviors promoted by LINKAGES were incorporated into JSI's health worker and community-level training modules and community mobilization activities.

Since 1999, LINKAGES has worked in close partnership with JSI at the national and district level. LINKAGES partnership with JSI facilitated the implementation of the integrated behavior change strategy at the district level, which began with the placement of two-person teams of LINKAGES and JSI health technicians in each of the target health districts in Antananarivo and Fianarantsoa regions. During the study period, LINKAGES and JSI health technicians worked in close collaboration to provide technical assistance to district MOH personnel to support their training and supervision activities. LINKAGES technicians assisted with health worker trainings and refresher trainings in breastfeeding, nutrition, micronutrients, Baby Friendly Hospitals, and the nutrition elements of IMCI. JSI technicians provided support for trainings on family planning, immunizations, reproductive health, and non-nutrition aspects of IMCI. In addition, the technicians partnered in organizing and conducting health facility and community-level activities, including trainings, supervisions and community mobilization activities.

LINKAGES and JSI share the costs of the integrated aspects of their programs. At the district level, costs related to the functioning of the field offices for the LINKAGES and JSI health technicians are shared, as well as the costs for community outreach and supervision activities. In cases where the district and community-level activities are conducted jointly by LINKAGES and JSI technicians, labor costs are also shared. The harmonization of IEC materials and mass media messages that relate to breastfeeding and maternal nutrition behaviors has also enabled cost sharing in the dissemination

of nutrition-related messages. In addition, JSI also supported monitoring and evaluation activities, including the baseline household survey in 2000.

3.2.2. Ministry of Health

During the study period, LINKAGES health technicians worked closely with the DHMT in each of the ten target districts to plan, organize, and implement trainings and other activities to promote breastfeeding and maternal nutrition. LINKAGES trained district-level MOH trainers in nutrition using the LINKAGES training modules. LINKAGES then assisted the DHMT to plan and conduct their own formal trainings and refresher trainings for public and private health providers, as well as supervision activities. At the district level, LINKAGES technicians also assisted in the implementation of the Baby Friendly Hospital Initiative, launched by the MOH in 1995, to improve the quality of care in hospital maternity wards.

At the health facility level, MOH health staff are trained to incorporate the promotion of infant and young child feeding and maternal nutrition behaviors into their health facility activities, including patient consultations and formal and informal health education talks. Health facility staff also assist in training and supervision of community leaders and volunteers and women's groups, who then disseminate nutrition messages and assist women in adopting nutrition behaviors in their own communities.

From December 2000-October 2001, many of the trainings, supervision, and community mobilization activities carried out in support of both the LINKAGES and JSI projects were funded by USAID through public sector Appui aux Activities de Promotion de Sante (AAPS) grants given directly to health districts. The AAPS grants were managed by the health districts with the technical support of JSI and LINKAGES technicians in planning and management.

3.2.3. Non-government Organizations (NGOs)

In each district during the study period, LINKAGES forged partnerships with a diverse mix of NGOs whose existing activities related to health/nutrition. The NGOs partners included large organizations receiving donor funding, local chapters of international organization such as the Red Cross, and small, community and church-based associations.

Select staff at each of the partnering NGOs received training in infant and young child feeding, nutrition, and the use of related IEC messages. The trained staff then trained other staff members in their organizations on how to promote essential nutrition activities in their on-going educational and community activities. During the study period, most of the NGOs that were very active in promoting nutrition messages at the community level tended to be the small community or church-based organizations whose outreach staff were volunteers.

3.2.4. Community-level partners

A key component of the LINKAGES program in Madagascar is building the capacity of and utilizing community-based volunteers, including women's groups, to disseminate nutrition messages and assist women in adopting improved health behaviors. During the study period, community volunteers received training in breastfeeding and nutrition and effective BCC methods. Community volunteers were selected due to their leadership or involvement in community affairs or groups and/or because

they were well-respected members of the community. These volunteers were then expected to carry out nutrition education activities within their communities through household visits, community meetings or educational sessions, and daily life activities.

4. Methodology

The period examined in this study is January 2000 through October 2001. This period was selected to coincide with the JSI/LINKAGES' baseline household survey of essential nutrition actions conducted in January 2000 and the rapid assessment of LINKAGES' and JSI's behavior change strategy conducted in October 2001. A comparison of the results of these two surveys provides documentation of activity outcomes during the study period.

LINKAGES requested that this cost effectiveness study focus on six of LINKAGES seven key indicators to measure changes in infant and young child feeding and maternal nutrition practices during the study period:

1. Exclusive breastfeeding (EBF) rate of infants 0–6 months of age
2. Timely initiation of breastfeeding (TIBF) rate
3. Breastfeeding women with children 0-5 months that use LAM as a method of family planning (LAM)
4. Complementary feeding (CF) rate of children 6–23 months of age
5. Increased frequency of breastfeeding during illness of children 0-23 months of age (FSC)
6. Increased eating by breastfeeding women with children aged 0-11 months of age (MN)

While controlling Vitamin A deficiency was also one of LINKAGES' goals, baseline and outcome data were not comparable for the study timeframe, and so cost effectiveness for Vitamin A control could not be included.

4.1. Types of Costs Included in the Analysis

LINKAGES efforts to promote infant and young child feeding and maternal nutrition practices incur costs at both the LINKAGES/Madagascar office and at the program headquarters in Washington, DC. This study considers all these costs.

All field costs incurred during the study period to support and implement LINKAGES/Madagascar nutrition promotion activities are included in this analysis. This includes the allocation of all overhead/fixed costs (office administration, rent, office equipment, etc.) associated with the LINKAGES/Madagascar office in Antananarivo and the district offices for the LINKAGES/JSI health technicians. Goods that were donated or lent to LINKAGES are not captured in this analysis – these goods include used vehicles and office equipment lent to LINKAGES by JSI. The cost of these goods was not included because they would have an insignificant effect on total costs, and so was not worth investing resources required to accurately estimate the costs.

Direct costs of the LINKAGES/DC office associated with nutrition promotion in Madagascar are also included. Indirect costs of LINKAGES/DC (including DC office rent, accounting, financial management and billing, contracts management, etc.) are not included. This is in part because the overhead costs related to LINKAGES/DC and the LINKAGES contractor would not be incurred in replication in-country. Further, the administrative and overhead structure exists for a wide array of activities, and does not vary based on community-based nutrition activities in Madagascar.

Partner costs related to nutrition promotion activities are also included. Examples of these costs are staff time, costs of training workshops, and per diem and transportation for supervision and community mobilization activities. Partner overhead/fixed costs are excluded because infant and young child feeding promotion and maternal nutrition represent a very small portion of their overall activities, and have minimal impact on their fixed costs, whether analysis is of cost effectiveness or replication costs.

Household or volunteer costs are not included in this study for several reasons – volunteers had worked with NGOs and in communities prior to LINKAGES interventions, the costs of volunteer time are not incurred costs, and the opportunity cost of the volunteers would have minimal impact on overall cost effectiveness. Further, volunteers receive some compensation in the form of T-shirts or gifts, the costs of which are included in the costs of specific activities. Table 1 summarizes the types of costs included in this analysis.

Table 1: Types of Costs Included in Analysis

Partner	Costs Included	Costs Excluded
LINKAGES/DC	• Direct costs – TDY costs, consultancies, technical and other support to Madagascar, etc	• Indirect costs of the DC office are excluded for analysis of the costs of replicating activities (DC office rent, financial and contracts management, etc)
LINKAGES/Madagascar	• Direct costs – cost of staff, training workshops, development of materials, monitoring and evaluation, etc. • Indirect costs – cost of Madagascar office in Antananarivo and LINKAGES/JSI district offices (rent, utilities, support staff, administration)	• Cost of used vehicles and office equipment donated or lent to LINKAGES/Madagascar by JSI
Partners	• Direct costs – cost of staff, training workshops, supervision, community mobilization activities, monitoring and evaluation, etc.	• Indirect costs – administration exists primarily for other activities • Volunteer costs – not incurred costs, and would have little overall impact on analysis

4.2. Allocation of Costs to Activities

LINKAGES/Madagascar conducts a variety of activities at the national and district/community level. Each activity that took place during the study period was reviewed with consideration of its objectives and content, and a subset of activities was designated as ones supporting appropriate infant and young child feeding and maternal nutrition practices at the community level. Other activities focused on central level advocacy or development of health staff training. The direct costs for each activity (community level infant and young child feeding and other activities) were compiled (see Annex A for a list of all LINKAGES activities, specifying whether the activity costs were included in this study). Overhead and administrative costs were pro-rated across all activities based on the direct cost

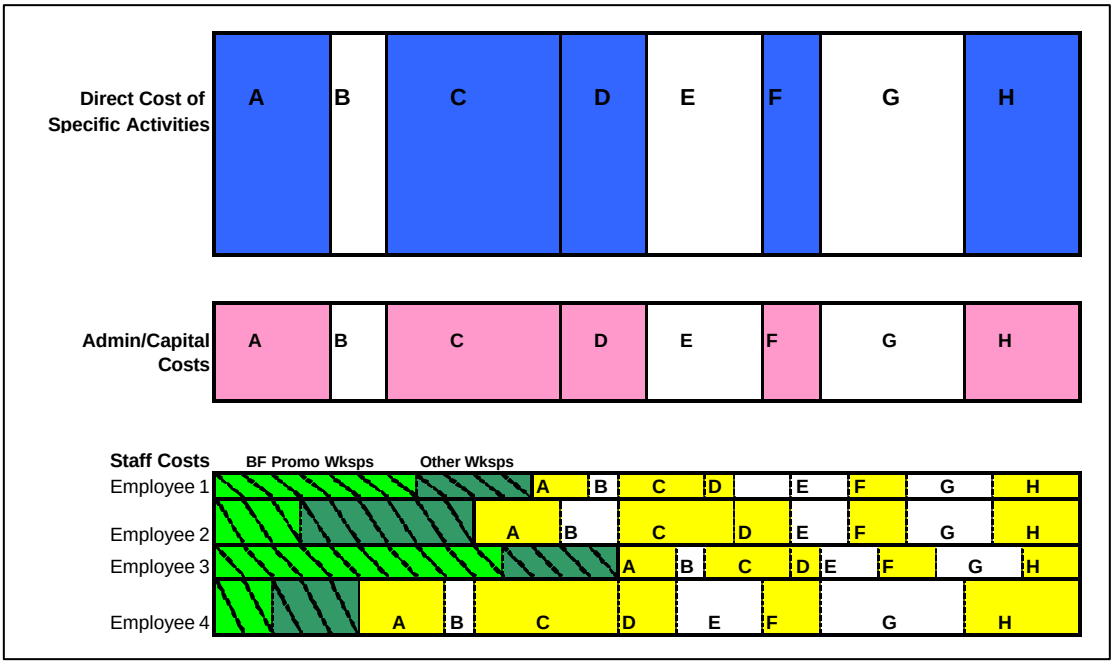
of each activity. A one-year estimate of the capital costs was calculated based on useful life, and then pro-rated across all activities based on the direct cost of each activity.[2] In some cases, data on actual staff time spent by activity was not available, so LINKAGES/Madagascar staff costs were allocated specifically by attendance in workshops, with unspecified time allocated pro-rata across all activities based on the direct cost of the activity.

LINKAGES/DC costs were allocated to specific activities where appropriate (consultancies, workshop attendance, etc). Non-specific support costs were pro-rated across all LINKAGES/Madagascar activities based on the direct cost of the activity. Thus, all costs incurred during the study period were allocated to the full set of LINKAGES' activities, a subset of which is included in this study.

Costs for partner activities were calculated in a similar way. Descriptions of activities were collected through interviews with partners (JSI, district-level MOH personnel, health facility staff, NGO officials). Data on the direct cost of each activity were collected. Activities included training workshops, outreach support, community-level health festivals, and supervision and monitoring. Staff cost was allocated based on actual time in workshops and staff estimates of time allocated to infant and young child feeding and maternal nutrition activities. Staff time not directly attributable to workshops was allocated across activities based on the direct cost of the activity.

Figure 1 shows an illustrative allocation of LINKAGES costs. The top rectangle represents all of the direct costs of LINKAGES activities A, B, C, etc. A subset of these activities is included in this study, as indicated in blue. The second rectangle represents all of LINKAGES' administrative costs, and their allocation to each of the activities. The bottom rectangle represents LINKAGES staff costs, of which the portion in green is attributable to specific activities. The remaining staff cost is then allocated across all activities.

Figure 1: Allocation of LINKAGES' Costs



[2] The cost of IEC materials purchased during the study period were also annualized based on LINKAGES' estimate that most of the IEC materials purchased in large quantities during the study period would be used

4.3. Allocation of Activity Costs to District Level Behavior Change

LINKAGES' costs for each activity were allocated to each of LINKAGES' intervention districts using several methods. Costs for trainings, supervision, and community mobilization activities were directly attributed to each district. District-specific staff costs, including LINKAGES district health technicians, were also allocated directly to districts. Costs for development of IEC materials and mass media messages reaching all of LINKAGES intervention districts were allocated evenly across all of these districts, including the additional 13 districts in which LINKAGES worked after July 2001. Localized mass media messages were allocated to the districts reached by the transmission.

JSI and MOH costs were allocated in the same manner as LINKAGES costs. Costs for district and community-level nutrition promotion activities were allocated directly to the districts in which the activities were implemented. The costs of JSI's IEC materials and mass media messages related to nutrition were allocated evenly across all districts in which JSI was working during the study period.

The content of each activity was reviewed and apportioned based on its messages on EBF, TIBF, CF, LAM, FSC, and MN. For trainings, apportioning an activity to a behavior was based on review of each LINKAGES and JSI training module and the time spent[3] discussing different topics. However, while time spent on breastfeeding could be isolated, it was harder to determine what portion of the discussion on breastfeeding was related to EBF vs. TIBF. Therefore, the time apportioned to breastfeeding was divided evenly between EBF and TIBF behaviors when information was not available to make exact allocations. For some activities, there was no quantitative basis for apportionment to targeted behavior – for example, routine supervisions by LINKAGES health technicians. In these cases, the costs of activities were apportioned evenly to all indicators.

In addition to the costs related to EBF, TIBF, CF, LAM, FSC, and MN, costs are also presented on an aggregated basis for each district and region. There aggregated costs provide a more accurate estimate of the cost of expansion, since a certain portion of activity costs are fixed, and would not be reduced even if only one behavior change were targeted. To calculate the cost-effectiveness of LINKAGES' activities, costs are aggregated to the provincial level because the small sample sizes for each district in the 2001 rapid assessment do not allow for valid intra-district effectiveness (outcome) comparisons.

4.4. Use of Rapid Assessment to Measure Outcomes

The measure of effectiveness used in this study is based on the findings of the baseline household survey conducted in January 2000 and a Rapid Assessment (RA) conducted in October 2001. The baseline survey was conducted in seven of JSI/LINKAGES' ten intervention districts during the study period – three districts in the region of Fianarantsoa (Ambohimahasoa, Ambositra, and Fianarantsoa I) and four districts in the region of Antananarivo (Antisirabe I, Betafo, and Tana Nord, and Tana Sud). The districts of Antsirabe II, Fianarantsoa II, and Tana Ville were not included since data on these districts was already available from studies previously conducted under the USAID-funded BASICS project. For this study, however, baseline indicators will be based solely on the results of

over a 3 year period.

[3] Time spent on a particular topic was estimated by calculating the proportion of pages in the training module that were devoted to that message.

the 2000 baseline survey. Results from the seven districts are aggregated to the provincial level under the assumption that the sample in the selected districts is representative of nutrition behaviors for the region as a whole.

The 2001 rapid assessment was conducted in all ten of LINKAGES' initial intervention districts. In each district, one commune where LINKAGES' behavior change strategy was being implemented relatively effectively by LINKAGES and its partners, particularly women's groups, was selected for the study. The assessment sampled a total of 640 mothers with infants less than two years old in the ten communes selected.

The baseline survey and rapid assessment provide data for all of the key indicators except Vitamin A, which is not available due to lack of comparable data between the two surveys. Table 2 shows the 2000 baseline and RA 2001 data, by region, for each of the six indicators.

Table 2: Key Indicators – Baseline and Outcome Data

	EBF		TIBF		LAM		CF		FSC		MN	
	BL	2001	BL	2001	BL	2001	BL	2001	BL	2001	BL	2001
Tana	44%	82%	43%	64%	2%	31%	31%	61%	11%	25%	5%	78%
Fiana	50%	86%	23%	77%	1%	59%	39%	88%	9%	24%	11%	62%
Overall	46%	83%	34%	69%	2%	34%	34%	72%	10%	25%	7%	71%

As the results of the rapid assessment show, there were significant increases in all indicators in both regions during the study period.

4.5. Indicators of Cost Effectiveness

Cost effectiveness analysis generally results in a ratio that represents costs per unit of output – the unit of output varies depending on the activity measured. Three measures of cost effectiveness are used in this study: 1) cost per beneficiary, defined as the total population in the coverage area; 2) cost per targeted child, defined as the number of children in the targeted age group; and, 3) cost per new acceptor, defined as the number of people whose behavior has changed. While the first two indicators look at unit costs, only the third indicator compares costs with outcomes. Since the outcome data available was at the behavior change level (not actual health outcomes), it is necessary to develop an indicator that compares costs with behavior change. The indicator used throughout this study to measure cost effectiveness is the cost per new acceptor for each of the targeted behaviors (EBF, TIBF, LAM, CF, FSC, MN). The number of new acceptors is calculated by multiplying change in the rate of the targeted behavior (e.g., the EBF rate) by the total number of children targeted over the period. As an example, the indicator of the cost effectiveness of promoting EBF in each district is expressed in the following formula:

$$\frac{\text{[cost of activities to promote EBF]}}{\text{[target population]} * (\text{[EBF rate-RA 2001]} - \text{[EBF rate-baseline]})}$$

The denominator, the difference in EBF rate between RA 2001 and the baseline survey multiplied by the target population, represents the number of new acceptors, or people whose behavior has changed as a result of the infant and young child feeding promotion interventions. The cost of activities to promote EBF is divided by the estimated number of new acceptors, providing a measure of the costs

incurred per new acceptor to obtain the desired behavior change. A similar formula is applied with RA 2001 and baseline rates for the other five indicators to measure the cost effectiveness of promoting key nutrition behaviors.

4.6. Selection of Study Districts

The selection of districts was based on the districts included in the 2001 rapid assessment. However, only nine of the ten districts covered in the rapid assessment are included in this study. The district of Betafo in the region of Antananarivo was not included due to political instability during the data collection period that prevented the assessment team from collecting necessary partner data.

4.7. Comparability and Applicability of this Study

There have been few studies of the cost effectiveness of breastfeeding interventions in developing countries, and no studies of programs that are similar to LINKAGES' model of targeting rural areas, and acting solely as a catalyst or facilitator for desired behavior change. It is therefore difficult to provide results that are directly comparable with other studies of breastfeeding programs, although this study attempts a rough, indicative comparison. This study does not address the question of whether LINKAGES' interventions are more or less cost effective than other child survival interventions. However, the methodology developed can be used to analyze other breastfeeding and child survival interventions and is applicable across LINKAGES' program countries.

4.8. Limitations of this Study

As detailed earlier, the measures of cost effectiveness are based solely on a comparison of the results of the baseline and rapid assessment data. These measures are accurate to the extent that the rates of EBF, TIBF, LAM, CF, FSC, and MN estimated through these two surveys represent behaviors in LINKAGES' target districts. The 2001 rapid assessment was conducted only in those communes where LINKAGES strategy was effectively implemented. Therefore, the outcomes of the LINKAGES/Madagascar program in these communes may not be representative of outcomes in all communes or for the district as a whole. Nonetheless, the rapid assessment data provide the best available estimate of LINKAGES' impact on behavior change.

Because the cost effectiveness analysis is conducted over a limited time period, the results may not be representative of cost effectiveness over a longer time period. Interventions may become more efficient (increasing cost effectiveness) or it may be increasingly difficult to sustain high rates of the targeted behaviors (reducing cost effectiveness). This issue may be explored in a second phase of this study (under consideration) expanding the time horizon of the analysis by one year.

The measures of cost effectiveness also depend heavily on the allocation of costs of activities to the different behaviors targeted with each activity. Allocation of cost to each targeted behavior, as discussed in Section 4.3, is based on quantitative data wherever possible, which does not necessarily capture a basic distinction between what is required to encourage "one-time" behaviors (such as TIBF), versus "continuous" behaviors (such as EBF). As such, the allocation of costs to behavior change in this study may be overestimating the cost of TIBF (and underestimating the cost of EBF), since there is no adjustment to capture the difference between "one-time" and "continuous" behaviors.

4.9. Costing Terminology

There is a common terminology that is often used to describe different types of costs. This sub-section reviews the common costing terminology and explains some of the terms used within this report to prevent any confusion in terminology.

Costs are often categorized into fixed and variable costs, or capital and operating costs. Fixed costs are costs that do not vary with the volume of output (in this case the target population, or the number of children changing behavior), while variable costs do vary with output. Capital costs refer to costs of goods that have a useful life of more than one year (such as equipment or vehicles), while operating costs refer to items that have a useful life of under one year (such as supplies, radio broadcasts). Capital costs generally involve payment for some good that maintains value to the owner. Categorizing costs in these ways can serve many purposes, including analysis of pricing, cost control, profit maximization, and budget planning.

Categorizing costs in this manner has limited applicability to the questions addressed in this study – all costs are included in this study, and are allocated to activities as described earlier in this section. One important point that should be understood about the cost structure of these interventions is that most of the costs in Madagascar are fixed costs. Given that the unit of output is the number of people targeted or changing behavior, costs for most of the activities (district level training/workshops, Breastfeeding Week activities, monitoring and evaluation) are not tied to the target population. The activities that are tied to the target population (such as community outreach, where health personnel would spend more time in a village with many more people) are relatively low cost. Understanding the value of fixed costs and being able to determine the minimum level of fixed costs per district/region will allow LINKAGES to improve cost effectiveness in the future.

These concepts are useful in understanding economies of scale and economies of scope, two terms used in this report. Economies of scale and scope exist when the average cost decreases with additional units of output, primarily because fixed costs are spread over a higher level of output. Both these terms refer to savings that can be realized by conducting activities on a larger scale or including a larger scope of activities.

Another cost-related term often used is *marginal cost*. Marginal cost refers to the additional cost to produce one additional unit of output. This study does not seek to analyze the marginal cost of reaching each additional child – this intervention is not a standard production or service delivery one, where the marginal cost is related to capacity and variable costs. Analysis of marginal cost goes beyond costing and would require data on the rate of behavior change, given varying baseline behavior rates, and varying levels of intervention.

Lastly, one of the key measures of cost effectiveness used in this report is the "cost per new acceptor." This term refers to the *total* costs incurred per child that is induced to change behavior – it does not refer to marginal cost, which is the *additional* cost incurred per additional child changing behavior.

5. Data Collection

Data collection for this study occurred in two phases. The first phase of data collection took place in Washington, DC from October – November 2002. The second phase of data collection was conducted in Madagascar from April – May 2003. Between these two intensive periods, there was ongoing data collection with LINKAGES' DC and Madagascar offices, as well as a field visit by Abt Associates to develop and field-test the data collection instruments that were used in the April/May 2003 data collection.

5.1. LINKAGES' Costs

Data on LINKAGES' costs were collected from records kept in the LINKAGES DC and Madagascar offices. The costs paid directly by the DC office are primarily costs related to the resident advisor, and costs for consultancies to support in-country activities. Other costs related to the Madagascar program are general DC-based management, administrative, and support costs.

LINKAGES' in-country costs were collected from the accountant in the LINKAGES/Madagascar office in Antananarivo. Costs to support activities in country are paid directly by the Antananarivo office, which had detailed cost information for the study period readily available. Cost data was disaggregated by specific activities (such as the cost for a training on a line item basis), and for overhead costs (such as office equipment and supply expenditures). The data from Antananarivo was maintained in Malagasy francs.

Data on total costs related to Madagascar activities were collected at the LINKAGES DC office. Data were disaggregated by general DC office support/management, field-based costs, resident advisor costs, and by specific consultancies to support in-country activities. The data from the LINKAGES/Madagascar office were compared with aggregate figures of field-based costs from the DC office. There were some differences in the DC and Madagascar office's total cost figures. These may be due to differences in the DC and field office accounting systems. In addition, the data from the Madagascar office were maintained in Malagasy francs (which were then converted to US dollars using an average exchange rate for the period), while the data in DC used the actual exchange rate at the time of each expenditure report. In light of the time it would have taken to disaggregate the DC data to the level of detail available in Madagascar, or to apply the actual exchange rate for each expenditure to the detailed data from Madagascar, the data from Madagascar is used (which was available with a high level of detail), and an average exchange rate (US $1 = MGF 6,557) over the period was applied for conversion to US dollars.

5.2. JSI Partner Costs

Data on JSI partner costs were collected through interviews, document reviews, and financial data provided by the JSI/Madagascar office. Data were collected on activities conducted, expenditures, and estimates of staff time spent on nutrition promotion activities. Key informants among the central administration (management and finance/accounting) and program staff were interviewed to identify the different ways in which JSI supported the LINKAGES/Madagascar program. The interviews focused on the description of JSI's overall program, specific activities undertaken during the study period, and staff time dedicated to nutrition promotion activities.

To estimate the costs of JSI activities carried out during the study period, several data sources were used. JSI central-level expenditures on IEC materials and mass media activities were provided by the JSI/Madagascar accountant. For district and community-level activities, two different cost estimation methods were used for activities carried out in 2000 and 2001. For both years, initial cost data was provided by JSI's accountant based on an electronic search of JSI's financial ledgers. The completeness of this initial data was verified by reviewing Monthly Activity Reports submitted by JSI and LINKAGES health technicians in each district. For activities carried out from January – October 2001, the financial data provided by JSI were found to be relatively complete. In cases where activities recorded in the Monthly Activity Reports for this period were not represented in the financial data, or where the description of the expenditure was not sufficient to link it to a particular activity, additional data was collected from JSI invoices and expense reports.

For JSI activities conducted in 2000, however, the initial financial data generated by the electronic search of JSI's financial ledgers were very limited. Given the high volume of invoices from 2000 that would have had to be reviewed to identify all district/community level costs, Monthly Activity Reports were used to generate a complete list of JSI activities conducted in each district in 2000. MOH/AAPS data from each district on expenditures for the same or similar activities (training workshops, supervisions, and community mobilization) conducted in 2001 were then used to estimate the cost of JSI activities carried out in 2000.

5.3. MOH Partner Costs

Data on the costs of MOH nutrition promotion activities at the district and health facility level were collected through interviews with MOH personnel and district reports submitted to USAID on AAPS-funded activities.

At the district level, interviews were conducted with key DHMT members in each district to determine staff time spent on LINKAGES and JSI trainings, planning and reporting on nutrition-related activities, and integrated supervision visits to health facilities. At the health facility level, interviews were conducted with health staff to determine the amount of staff time spent discussing specific nutrition topics during various types of consultations, during informal and formal health education talks, and during integrated supervisions conducted by the DHMT. Staff time spent on nutrition promotion activities was estimated for the period after the staff received LINKAGES' training until October 2001, the end of the study period. As such, much of the data on MOH staff costs are based on recall of activities implemented, estimates of staff time commitments, and estimates of activity costs from the study period. Although several staff provided a written estimates of costs, no historical documents (expense reports, budgets, etc.) were available verifying the cost estimates.

As noted earlier, from December 2000 – October 2001 most of the district-level activities that were planned and implemented in collaboration with JSI and LINKAGES health technicians were funded by USAID AAPS grants to health districts. To identify and estimate the cost of nutrition promotion activities funded by USAID AAPS, technical and financial reports submitted to USAID were collected from each district and reviewed. In five of the nine districts, the final technical reports submitted to USAID in October 2001 provided complete data on expenditures by activity during the eleven-month period of AAPS funding. In the other four districts, information from the AAPS reports

was combined with information in the JSI and LINKAGES Monthly Activity Reports to generate a complete list of AAPS-funded activities. Cost estimates for each activity were based on expenditure data for similar AAPS-funded activities in other districts.

5.4. Data Limitations

Given the nature of a retrospective study, data access was not easy, particularly with some of the partners. Sometimes data required adjustment for use in this study. In some cases, data could not be reconciled across several sources, and a judgment was made to use available data from the source or sources deemed more reliable. There was no quantitative data regarding staff time dedicated to breastfeeding activities, so calculations of staff time costs are based on staff recall of estimated time spent on activities.

There were also instances of incomplete data – in these cases estimates were made to complete the study. Generally the estimates were based on data in other districts. For example, where there was no data on the amount of time a midwife spent on breastfeeding during a consultation or health education talk, an average from the other districts was used. For private sector health providers, salary information was not available and salaries were assumed to be the same as their public sector providers.

6. Findings

The findings presented are organized along each of the study questions:

- How do costs and outcomes compare across the two regions?
- What are the determinants of costs and cost effectiveness?
- How can LINKAGES improve its cost effectiveness?
- What are the costs of replicating these interventions in Madagascar?
- How does the cost effectiveness of the interventions in Madagascar compare with other infant and young child feeding interventions?

Selected information is shown in the sections below to address the questions of interest. Annex B includes detailed cost data for LINKAGES and its partners.

6.1. How Do Costs and Outcomes Compare Across the Study Regions?

Overall Finding: *Comparing costs on a per beneficiary basis (defined as the total population of the program areas), there appears to be a positive relationship between costs and behavior change outcomes.*

To answer the question of how costs and outcomes in the two regions compare, all costs for LINKAGES Madagascar and DC based activities and partner activities to promote six target indicators are included.

6.1.1. LINKAGES' Costs

Table 3 shows the LINKAGES incurred costs for the two regions, allocated by the six key indicators. Total cost of LINKAGES' activities to promote the key indicators in Antananarivo were $478,864, compared with $353,314 in Fianarantsoa. On a per beneficiary basis (defined as the total population of the program areas) using an average number of beneficiaries over the study period, the cost was $0.54 in Antananarivo, and $0.79 in Fianarantsoa.

Table 3: LINKAGES' Costs Allocated by Indicator

	Antananarivo		Fianarantsoa	
Number of Beneficiaries	**886,291**		**448,906**	
Indicator	**Total Cost**	**Cost Per Beneficiary**	**Total Cost**	**Cost Per Beneficiary**
EBF	197,783	0.22	163,541	0.36
TIBF	35,394	0.04	30,251	0.07
LAM	97,644	0.11	70,612	0.16
CF	99,580	0.11	50,641	0.11
FSC	36,622	0.04	30,435	0.07
MN	11,841	0.01	7,834	0.02
TOTAL	**$478,864**	**$0.54**	**$353,314**	**$0.79**

6.1.2. Partner Costs

Total costs incurred by LINKAGES' partners are shown in Table 4.

Table 4: Partner Costs (JSI, MOH) Allocated by Indicator

	Antananarivo		Fianarantsoa	
Number of Beneficiaries	**886,291**		**448,906**	
Indicator	**Total Cost**	**Cost Per Beneficiary**	**Total Cost**	**Cost Per Beneficiary**
EBF	17,188	0.02	14,000	0.03
TIBF	4,915	0.01	3,186	0.01
LAM	7,865	0.01	5,291	0.01
CF	19,419	0.02	13,896	0.03
FSC	10,100	0.01	6,540	0.01
MN	5,545	0.01	2,397	0.01
TOTAL	**$65,032**	**$0.07**	**$45,310**	**$0.10**

Total partner costs in Antananarivo were $65,032, representing approximately $0.07 per beneficiary. In Fianarantsoa, total partner costs were $45,310, representing $0.10 per beneficiary.

6.1.3. Package of LINKAGES and Partner Interventions Compared with Outcomes

Table 5 shows presents the total cost of LINKAGES and partner activities compared with the outcomes in each of the key indicators. Total costs in Antananarivo were $543,898, compared with $398,621 in Fianarantsoa.

Table 5: Relationship Between Costs and Outcomes (LINKAGES and Partner Costs)

	Antananarivo			Fianarantsoa		
Number of Beneficiaries	**886,291**			**448,906**		
Indicator	**Cost**	**Per Beneficiary**	**Pct Chg in Indicator**	**Cost**	**Per Beneficiary**	**Pct Chg in Indicator**
EBF	214,971	**0.24**	38%	177,541	**0.40**	36%
TIBF	40,310	**0.05**	21%	33,436	**0.07**	54%
LAM	105,510	**0.12**	29%	75,903	**0.17**	58%
CF	118,999	**0.13**	30%	64,536	**0.14**	49%
FSC	46,722	**0.05**	14%	36,975	**0.08**	15%
MN	17,386	**0.02**	73%	10,230	**0.02**	51%
TOTAL	**$543,898**	**$0.61**		**$398,621**	**$0.89**	

Although total costs were higher in Antananarivo, the cost on a per beneficiary basis was much lower at $0.61, compared with $0.89 in Fianarantsoa. Comparing the costs per beneficiary, there is a positive relationship between costs and outcomes (except for two indicators – EBF and MN), that is, outcomes in Fianarantsoa (which incurred higher costs per beneficiary) were generally more positive than in Antananarivo.

6.2. What are Determinants of Costs and Cost Effectiveness?

> ***Overall Finding****: The cost of training activities and mass media are the key cost drivers, and explain the largest differences in the cost structure between the two regions. The relationship between the size of the target population and cost effectiveness is not completely clear, which may be because economies of scale (potential savings from targeting a large population) are not great for behavior change, or because the size of the target population exceeded the threshold for which economies can be realized. The data is mixed on whether the baseline rate of the targeted behavior impacts cost effectiveness.*

Higher total cost or cost per beneficiary does not necessarily imply lower or higher cost effectiveness (defined as cost per new acceptor). Many factors affect total costs and cost effectiveness. Costs are disaggregated in a variety of ways to examine patterns among different types of costs, and factors that affect cost effectiveness.

6.2.1. Key Cost Drivers

Very generally, the cost patterns in the two regions are similar – costs in both regions were concentrated in training activities (63% of costs in Antananarivo and 60% of costs in Fianarantsoa), with BFHI, mass media, monitoring and evaluation, and IE&C activities the next largest cost components. However, within this general outline, there are some key differences between the two regions. Much of the differences in the cost structure is due to differences in the stage of implementation between various districts, although these differences are somewhat masked by the aggregation of data to the provincial level.

Although training was clearly the highest cost activity in both regions, there was a significant difference in the type of training, and the cost per beneficiary. Table 6 shows the cost of each activity by region. Total training cost per beneficiary was 36% higher in Fianarantsoa ($0.54) than in Antananarivo ($0.40). In Antananarivo, training of the women's groups (GF) comprised 46% of total costs, compared with 51% in Fianarantsoa. More striking, the cost of GF training represented $0.28 per beneficiary in Antananarivo, and $0.46 per beneficiary in Fianarantsoa. There is also a significant difference in the cost of PSI training (training of a network of private doctors), which comprised 12% of total costs in Antananarivo and 3% of total costs in Fianarantsoa. On a per beneficiary basis, PSI training costs were nearly three times higher in Antananarivo ($0.08) than in Fianarantsoa ($0.03). Overall, costs were higher in Fianarantsoa, and a larger proportion of costs were spent on GF training.

Another notable difference can be found in the mass media costs. Although total mass media costs were similar in the two regions ($46,727 in Antananarivo and $54,196 in Fianarantsoa), it represented 14% of total costs in Fianarantsoa, while only 9% of costs in Antananarivo. On a per beneficiary basis, the costs in Fianarantsoa ($0.12) were more than twice that of Antananarivo ($0.05), since the coverage population in Antananarivo was approximately double that in Fianarantsoa.

Table 6: Cost By Activity (LINKAGES and Partner Costs)

	Antananarivo			Fianarantsoa		
Activity	**Cost**	**As % of Total Cost**	**Cost per Beneficiary**	**Cost**	**As % of Total Cost**	**Cost per Beneficiary**
GF Training	249,205	46%	0.28	204,451	51%	0.46
Health Wkr Train'g	18,205	3%	0.02	10,645	3%	0.02
PSI Training	67,399	12%	0.08	12,303	3%	0.03
TN Training	8,150	1%	0.01	9,464	2%	0.02
JSI Training	6,893	1%	0.01	4,231	1%	0.01
BFHI	36,311	7%	0.04	25,542	6%	0.06
Festival, BF Wk, etc	24,880	5%	0.03	11,917	3%	0.03
Mass Media	46,727	9%	0.05	54,196	14%	0.12
RA/M&E	28,779	5%	0.03	23,023	6%	0.05
IEC	33,701	6%	0.04	26,961	7%	0.06
Services/Sensitiz.	10,296	2%	0.01	5,564	1%	0.01
Mgmt/Spvsn	1,948	--	--	1,842	--	--
Miscellaneous	11,404	2%	0.01	8,483	2%	0.02
TOTAL	**$543,898**	**100%**	**$0.61**	**$398,622**	**100%**	**$0.89**

Although the outcome data do not allow comparison on a district level, the variation in costs is due to differences in activity at the district level. There was significant variability in the training costs overall, and within each type of training conducted – for example, cost of GF training in Fianarantsoa II district was $67,322, compared with $21,377 in TanaVille district (primarily due to the timing of implementation). The level of mass media activities conducted at the district level was also quite different, with several districts not conducting mass media at the district level, as radio stations were not available in all districts.

Overall, the cost of training activities and mass media were the key cost drivers, and explain the largest differences in the cost structure of the two regions.

6.2.2. Cost Effectiveness and Partner Participation and Input

There was little difference in the level of partner participation in the two regions – unlike in other countries, LINKAGES had the same key partners (JSI, and MOH) in both regions. LINKAGES activities represented nearly 90% of total costs in both regions. There were some differences in the concentration of partner resources among activities that focus on different indicators. For example, the partners provided a larger portion of the costs related to MN (32% in Antananarivo and 23% in Fianarantsoa) than to EBF (8% in both regions).

Table 7 shows the breakdown between LINKAGES and partner costs allocated to the six indicators, compared with the cost per new acceptor. There were only small differences in LINKAGES' costs as a percent of total costs across the six indicators, and these differences did not appear to be associated with differences in cost effectiveness.

Table 7: Comparison of LINKAGES and Partner Cost Breakdown and Cost Effectiveness

	Antananarivo			Fianarantsoa		
Indicator	**Total Cost (US$)**	**LINKAGES Cost as % of Total**	**Cost per New Acceptor (US$)**	**Total Cost (US$)**	**LINKAGES Cost as % of Total**	**Cost per New Acceptor (US$)**
EBF	255,112	**92%**	10.70	210,660	**92%**	18.54
TIBF	47,397	**88%**	3.63	39,492	**90%**	2.33
LAM	124,730	**93%**	6.88	89,857	**93%**	4.92
CF	138,828	**84%**	5.48	74,854	**78%**	3.47
FSC	54,007	**78%**	3.90	43,023	**82%**	5.41
MN	19,897	**68%**	0.41	11,927	**77%**	0.67

Given the small differences in partner participation between the two regions, and the limitations of financial data, the level of partner participation does not appear to be a major factor in determining cost effectiveness.

6.2.3. Cost Effectiveness and Target Population

Although the size of the target populations[4] in the two regions was very different, population size by itself did not have a clear impact on cost effectiveness. Table 8 shows the target population for each of the key indicators and the cost per new acceptor.

Table 8: Comparison of Target Population and Cost Effectiveness

	Antananarivo			Fianarantsoa		
Indicator	**Total Cost (US$)**	**Target Population**	**Cost per New Acceptor (US$)**	**Total Cost (US$)**	**Target Population**	**Cost per New Acceptor (US$)**
EBF	214,971	**52,859**	10.70	177,541	**26,594**	18.54
TIBF	40,310	**52,859**	3.63	33,436	**26,594**	2.33
LAM	105,510	**52,859**	6.88	75,903	**26,594**	4.92
CF	118,999	**72,355**	5.48	64,536	**38,007**	3.47
FSC	46,722	**85,503**	3.90	39,975	**45,591**	5.41
MN	17,386	**58,184**	0.41	10,230	**29,862**	0.67

As the data show, even though Antananarivo has a target population approximately double that of Fianarantsoa, its cost per new acceptor is lower for two indicators (EBF and MN) only. This outcome appears to be more related to effectiveness than to costs, as costs are only approximately 20% - 39% higher than in Fianarantsoa for several indicators (TIBF, CF, FSC).

It is clear that the additional costs of targeting more people within the same region declines, but this does not necessarily improve overall cost effectiveness. There may be economies of scale to be gained by increasing the target population – that is, the number of beneficiaries in Antananarivo is 97% higher than in Fianarantsoa, while total costs in Antananarivo are only 36% higher. However, these economies do not always lead to improving cost effectiveness.

[4] The target population is calculated based on the total population in the district and the percent of the population falling within the target age groups for each of the target behaviors.

There are many interpretations of this finding. One interpretation is the economies of scale are not great in terms of behavior change, and that higher spending or different or more activity is required to achieve behavior change in such a large population. On the other hand, there may be economies of scale up to a certain threshold population, after which no further economies can be realized. Determining that threshold, and thus the population level at which additional activities are needed, would be a key factor to improving the cost effectiveness of future interventions.

6.2.4. Cost Effectiveness and Marginal Costs

Although there were some data to show that increasing marginal cost of achieving higher rates of the targeted behaviors may be responsible for differences in cost effectiveness between the two regions, the result is not conclusive. As explained in Section 4.9, marginal cost refers to the additional cost required to produce one additional unit of output. Marginal cost is generally expected to increase as you reach higher behavior rates – that is, it may be more costly to increase EBF from 80% to 90% than it is to increase EBF from 30% to 40%. The data in Madagascar were somewhat mixed as to whether marginal cost increases. Table 9 shows the baseline and outcome rates of the targeted behaviors, together with the cost per new acceptor.

Table 9: Comparison of Baseline and Outcome Behavior Rates and Cost Effectiveness

	Antananarivo			Fianarantsoa		
Indicator	**Indicator Baseline Rate**	**Indicator Outcome Rate**	**Cost per New Acceptor (US$)**	**Indicator Baseline Rate**	**Indicator Outcome Rate**	**Cost per New Acceptor (US$)**
EBF	44%	82%	10.70	50%	86%	18.54
TIBF	43%	64%	3.63	23%	77%	2.33
LAM	2%	31%	6.88	1%	59%	4.92
CF	31%	61%	5.48	39%	88%	3.47
FSC	11%	25%	3.90	9%	24%	5.41
MN	5%	78%	0.41	11%	62%	0.67

In several cases, lower baseline behavior rates do mean a lower cost per new acceptor – for example Antananarivo has lower baseline rates of EBF and MN, and lower costs per acceptor for both these indicators, while Fianarantsoa has a lower baseline rate of TIBF and a lower cost per TIBF acceptor. For CF, this is not true as Antananarivo has a lower rate of CF but a higher cost per new CF acceptor – primarily because behavior change was significantly lower than in Fianarantsoa. Since the baseline rates of LAM and FSC are so similar, we cannot draw any conclusions based on two regions. For those two indicators, it seems that the cost effectiveness may be more dependent on the target population or the level of behavior change.

6.3. What Would It Cost to Replicate These Activities in Madagascar and Is it Cost Effective?

Overall Finding: *The cost of replicating LINKAGES and partner activities to promote EBF, TIBF, and LAM is $6.23 per targeted child. The cost per beneficiary for this set of activities is $0.37. For the complete package of LINKAGES' activities aimed at improving all six indicators, the cost per beneficiary is $0.56. The costs per new EBF, TIBF, and LAM acceptor are $10.09, $2.33 and $4.44, respectively.*

6.3.1. Cost to Replicate Package of LINKAGES and Partner Activities

Determining the replication costs entailed a review of costs for all LINKAGES' activities in Madagascar, a subset of which are included in this study. Activities such as national policy and advocacy activities, study tours, and curriculum development for pre-service training were important elements of LINKAGES' program in Madagascar. However, these costs are not directly linked to community-level activities that would be replicated in other districts in Madagascar, and thus are excluded from the calculations.

The activities identified as targeting community level behavior change were classified as start-up/development activities, ongoing implementation activities, and monitoring and evaluation activities. Development activities are one-time activities that would not be replicated, such as workshops to develop key messages and materials. Implementation activities are an ongoing part of the program and include training workshops, community-level festivals, Baby-Friendly Hospitals and Workplaces, production of IEC materials, and radio broadcasts. Monitoring and evaluation activities are aimed only at assessing outcomes from the interventions. Table 10 shows the classification of all community-level behavior change activities conducted by LINKAGES and its partners.

Table 10: Classification of LINKAGES and Partner Community Level Behavior Change Activities from January 2000 – October 2001

ACTIVITIES	Start-up, Implementation, or Monitoring/Evaluation
Mass media	Start-up/Implementation
IEC materials	Implementation
Baby-Friendly Hospital Initiative (BFHI)	Start-up/Implementation
Baby-Friendly Workplaces	Implementation
District-level training of trainers	Implementation
Health workers and NGO training	Implementation
Community-level trainings (women's groups, etc.)	Implementation
PSI training	Implementation
Festivals (health festivals, Community Champion festivals)	Start-up/Implementation
Breastfeeding week	Implementation
Supervision	Implementation
Support to partner IMCI activities	Implementation
Support to Vitamin A campaign	Implementation
2000 Baseline survey	Monitoring/Evaluation
2000 LINKAGES Rapid Assessment	Monitoring/Evaluation
2001 LINKAGES Rapid Assessment	Monitoring/Evaluation

Disaggregating costs associated with implementation activities provides the most accurate estimate of costs of replicating activities in Madagascar. Start-up or development costs would not be incurred for replication in country – those costs include costs of developing training modules, IEC materials and mass media messages. Implementation costs cover the cost of conducting training workshops, producing IEC materials and mass media messages, and community mobilization efforts. Monitoring

and evaluation costs are not included as they do not directly produce behavior change and because evaluation costs are not included in other breastfeeding cost effectiveness studies, which are used for comparison.

The costs associated with implementation activities to promote EBF, TIBF, and LAM are shown in Table 11. These activities all target women with infants less than 6 months old, and can be grouped together to estimate replication costs per child. Total implementation costs for this subset of activities were $276,080 in Antananarivo and $219,112 in Fianarantsoa. Across both regions, the implementation cost per targeted child of promoting EBF, TIBF, and LAM was $6.23. While implementation costs were higher in Antananarivo, the cost per targeted child was lower ($5.22 in Antananarivo versus $8.24 in Fianarantsoa) due to the larger target population. The cost per beneficiary was $0.37 across both regions, $0.31 in Antananarivo and $0.49 in Fianarantsoa.

Table 11: Costs of Replicating EBF, TIBF, and LAM Promotion Activities, LINKAGES and Partner Implementation Costs Only

	Antananarivo	Fianarantsoa	Total
LINKAGES Costs (US$)	$246,112	$196,635	$442,747
Partner Costs (US$)	$29,968	$22,477	$52,445
Total Costs of EBF, TIBF, and LAM Promotion (US$)	**$276,080**	**$219,112**	**$495,192**
Target Population	52,859	26,594	79,453
Cost per Child (US$)	**$5.22**	**$8.24**	**$6.23**
Total Beneficiaries	886,291	448,906	1,335,197
Cost per Beneficiary (US$)	**$0.31**	**$0.49**	**$0.37**

Table 12 presents the implementation costs for the complete package of LINKAGES' activities aimed at improving all six indicators. Across both regions, the cost of the total package was $745,074, approximately 50% higher than for the subset of EBF, TIBF, and LAM promotion activities. Implementation costs for the total package were $434,206 in Antananarivo and $310,868 in Fianarantsoa.

Since activities to promote CF, FSC, and MN each target different populations (women with infants 6-23 months, 0-23 months, and 0-11 months, respectively), it was not possible to estimate the cost per targeted child for the complete package of LINKAGES' activities. However, the cost per beneficiary was calculated. Across both regions, the cost per beneficiary for the full package of activities was $0.56, ranging from $0.49 in Antananarivo to $0.69 in Fianarantsoa.

Table 12: Costs of Replicating Total Package of LINKAGES' Activities, LINKAGES and Partner Implementation Costs Only

	Antananarivo	Fianarantsoa	Total
LINKAGES Costs (US$)	$369,173	$265,559	$634,732
Partner Costs (US$)	$65,033	$45,309	$110,342
Total Costs of Nutrition Promotion Activities (US$)	**$434,206**	**$310,868**	**$745,074**
Total Beneficiaries	886,291	448,906	1,335,197
Cost per Beneficiary (US$)	**$0.49**	**$0.69**	**$0.56**

It should be made clear that this section examines only the cost of replicating activities in Madagascar. It would be inaccurate to apply this data to estimate replication costs in other countries, even ones with similar programs, because of differences in local costs. Further, this study did not include the costs of volunteer time (such as volunteer mother support group leaders or village health workers), since they are generally not formally employed and it is difficult to value their time. If these activities are replicated on a larger scale, volunteer costs could potentially become incurred costs, as paid workers may have to be employed to perform the tasks of the volunteers. Such costs would still have a small impact on overall costs, since the salaries paid would be low relative to other costs.

6.3.2. Cost Effectiveness of Replication

In addition to examining the cost of replicating these activities, it is also useful to examine the cost effectiveness of replicating these activities. As in the previous section, the cost of replicating these activities is limited to implementation costs only. Thus to measure cost effectiveness of replication, total implementation costs are compared with the number of new acceptors of the targeted behaviors (EBF, TIBF, etc), to calculate the implementation cost per new acceptor.

Tables 13 through 15 present the cost effectiveness of promoting EBF, TIBF, and LAM in Antananarivo and Fianarantsoa regions. As shown in Table 13, the cost per new EBF acceptor, if these interventions were replicated, is estimated to be $10.09. However, it should be noted that the cost per new EBF acceptor is significantly higher in Fianarantsoa at $14.22 than in Antananarivo at $8.12. While both regions experienced a similar increase in the EBF rate over the study period, the number of new acceptors in Fianarantsoa is lower due to its smaller target population, resulting in a higher cost per new acceptor in Fianarantsoa.

Table 13: Cost Effectiveness of Promoting EBF, LINKAGES and Partner Implementation Costs

	Antananarivo	Fianarantsoa	Total
LINKAGES and Partner Costs (US$)	**$163,190**	**$136,115**	**$299,305**
Target Population	52,859	26,594	79,453
Percent Difference between Baseline and 2001 RA	38%	36%	37%
Est. Number of New EBF Acceptors	20,087	9,574	29,661
Cost per New EBF Acceptor (US$)	**$8.12**	**$14.22**	**$10.09**

The results of a similar analysis to determine the cost per new TIBF acceptor are shown in Table 14. Across both regions, replication costs per new TIBF acceptor is $2.33. The cost per new TIBF acceptor was higher in Antananarivo ($2.91) than in Fianarantsoa ($1.88).

Table 14: Cost Effectiveness of Promoting TIBF, LINKAGES and Partner Implementation Costs

	Antananarivo	Fianarantsoa	Total
LINKAGES and Partner Costs (US$)	**$32,346**	**$27,066**	**$59,412**
Target Population	52,859	26,594	79,453
Percent Difference between Baseline and 2001 RA	21%	54%	35%
Est. Number of New TIBF Acceptors	11,100	14,361	25,461
Cost per New TIBF Acceptor (US$)	**$2.91**	**$1.88**	**$2.33**

Table 15 presents the cost effectiveness of replicating activities to promote the use of LAM. The cost per new acceptor of LAM is estimated at $4.44 across both regions. The lower costs in Fianarantsoa, together with the significantly higher increase in the LAM rate results in the lower cost per new acceptor of $3.63, compared with $5.25 in Antananarivo.

Table 15: Cost Effectiveness of Promoting LAM, LINKAGES and Partner Implementation Costs

	Antananarivo	Fianarantsoa	Total
LINKAGES and Partner Costs (US$)	**$80,545**	**$55,931**	**$136,476**
Target Population	52,859	26,594	79,453
Percent Difference between Baseline and 2001 RA	29%	58%	32%
Est. Number of New LAM Acceptors	15,329	15,425	30,754
Cost per New LAM Acceptor (US$)	**$5.25**	**$3.63**	**$4.44**

It should be noted that there are likely economies of scope to the integrated package of activities conducted by LINKAGES and its partners, such that the cost of targeting individual behaviors in isolation is likely higher. That is, if LINKAGES were to implement a program aimed at only one of these behaviors, the cost per new acceptor would likely be higher than what is shown here because some portion of the costs are fixed, and would not be reduced if only one behavior were targeted (for example, office space for administration).

These data alone do not allow us to draw conclusions about the cost effectiveness of replicating these activities versus other child health interventions, although this methodology could be applied to analyze other interventions for comparison. A follow-on analysis that may allow further conclusions to be drawn on the cost effectiveness of LINKAGES' interventions relative to other child health interventions would be to compare these costs with morbidity or mortality averted or Disability Adjusted Life Years (DALY) gained as a result of appropriate breastfeeding.

6.4. How Can LINKAGES Improve its Cost Effectiveness?

> ***Overall Finding***: *LINKAGES may be able to improve its cost effectiveness by selecting areas with large target populations and low rates of the targeted behaviors. More data and further analysis of the impact of the mix of activities, and the economies of scale associated with this type of behavior change is needed to better inform cost effective program design.*

Based on the findings in Madagascar, only limited recommendations can be made regarding how best to improve cost effectiveness. Although the data are not definitive, they do suggest that the size of the target population and marginal costs have some impact on cost effectiveness. Table 17 shows the target populations, together with baseline and outcome behavior rates and the cost per new acceptor. These data show that while each of the factors alone does not explain cost effectiveness, analysis of the interplay of these factors does provide suggestions for improving cost effectiveness.

Table 17: Comparison of Baseline and Outcome Behavior Rates and Cost Effectiveness

	Antananarivo				Fianarantsoa			
Indicator	Target Population	Indicator Baseline Rate	Indicator Outcome Rate	Cost per New Acceptor (US$)	Target Population	Indicator Baseline Rate	Indicator Outcome Rate	Cost per New Acceptor (US$)
EBF	57,429	44%	82%	**10.70**	26,594	50%	86%	**18.54**
TIBF	57,429	43%	64%	**3.63**	26,594	23%	77%	**2.33**
LAM	57,429	2%	31%	**6.88**	26,594	1%	59%	**4.92**
CF	78,392	31%	61%	**5.48**	38,007	39%	88%	**3.47**
FSC	92,545	11%	25%	**3.90**	45,591	9%	24%	**5.41**
MN	63,134	5%	78%	**0.41**	29,862	11%	62%	**0.67**

For example, for EBF, where the baseline and outcome behavior rates across the two regions are relatively similar, the size of the target population (57,429 in Antananarivo and 26,594 in Fianarantsoa) was the factor that drove cost effectiveness. These same factors also explain the outcomes for FSC, which also shows Antananarivo to be more cost effective than Fianarantsoa. For TIBF, Fianarantsoa had a much lower rate of TIBF at baseline (23% vs. 43%), and also achieved a higher outcome rate (77% compared with 64%), more than offsetting its significantly lower target population and making it more cost effective. For LAM and CF, behaviors for which the baseline rates are somewhat similar, the significantly better outcomes in Fianarantsoa explain why it is more cost effective than Antananarivo, despite its lower target population.

The baseline rate of the targeted behavior, the size of the target population, and the behavior outcomes together impact cost effectiveness. Based on this analysis, LINKAGES may be able to improve its cost effectiveness by selecting areas with large target populations and low baseline rates of the targeted behavior. Improving cost effectiveness can be further informed with data on the impact and cost effectiveness from specific activities or specific packages of activities, and the economies of scale to be gained from the increasing the size of the population.

Though there are some differences in the mix of activities in the two regions, the data available for this study do not allow analysis of individual activities or how the mix of activities impacts cost effectiveness. No recommendations can be made regarding how to improve cost effectiveness by

manipulating the mix of activities based on the Madagascar data. These types of findings may be available from comparing Madagascar with LINKAGES interventions in Ghana and/or Zambia, to be completed at a later date.

Because there are only two regions for comparison in Madagascar, it is difficult to draw conclusions about the size of the target population at which further economies of scale cannot be gained. The data suggest that the level of activities may need to be increased once the target population exceeds certain levels, in order to achieve the same level of behavior change. What may have been thought of as fixed costs – employing one district level coordinator, district level training – may need to be increased once the target population exceeds a certain level. Some conclusions regarding the economies of larger target populations may be possible with comparative analysis of the data from both Madagascar and Ghana, which will be conducted in 2004.

6.5. Is LINKAGES Cost Effective Compared with Other Infant and Young Child Feeding Interventions?

> ***Overall Finding***: *Although comparable studies are limited, LINKAGES breastfeeding promotion interventions in Madagascar appear to be cost effective at an average cost per new EBF acceptor of $10, compared with data from Brazil showing cost per new EBF acceptor to be $59, and data from Ghana showing cost per new acceptor to be $34.*

Other cost effectiveness studies of breastfeeding promotion interventions are limited. Apart from a sister study of LINKAGES' interventions in Ghana, the most notable studies of breastfeeding promotion cost effectiveness – indeed, the only studies available – were a series of studies conducted in 1992-93 in seven hospitals in Brazil, Honduras, and Mexico (funded through the USAID LAC-HNS project). It is difficult to compare the results of the LAC-HNS studies due to differences in the nature of the interventions (hospital- vs. community-based settings) and the nature of the study methodology. Nonetheless, some comparison is useful. Disaggregated data was only available for Brazil, and so detailed comparisons are made with that study only.

The nature of the interventions studied under LAC-HNS was very different from Madagascar and Ghana. Those studies included only interventions in hospitals in urban settings. In Madagascar, the intervention areas are a mix of urban and rural setting, while in Ghana, the intervention areas are among the most remote and least densely populated areas of the country. Because of the scale of the Brazil intervention, and the capacity of persons with direct contact with mothers, the hospitals studied did not use the model of cascading training of trainers, a component that accounts for a large portion of costs in the LINKAGES interventions. The primary costs in the LAC-HNS study hospitals were the costs of staff time for special clinics and individual counseling, the cost of changes in physical space required, and the cost of promotion materials.

The costing methodology and the effectiveness measures used were also very different. The LAC-HNS studies reported aggregate net costs, which took into account savings from breastfeeding (primarily the foregone cost of infant formula). The LAC-HNS studies include only implementation costs and exclude start-up or monitoring and evaluation costs. Hospital overhead and administrative costs were not included in the study. The measure of EBF was also different – in Brazil the EBF measure was based on interview results at a three-month follow-up visit. Thus, it only measures EBF

at three months after delivery. The summary data provides only the net cost (after savings from formula) per additional child breastfeeding. The disaggregated data were available for Brazil, and were adjusted to allow comparison here.

Under various assumptions, the gross cost of breastfeeding promotion per newborn in Brazil at the time of the study ranged from $11.09 to $11.94. The EBF rate in the program hospital was 43%, and was 20% in the control hospital. Based on an average cost per newborn of $11, this translates into a cost per new EBF acceptor of $48 ($11/23%). Applying the total inflation rate (in US dollar terms) of 22.4% between 1992 and 2000, the cost per new EBF accepter in Brazil was $59, in 2000 dollars. In Ghana, the average implementation costs per new EBF acceptor was $34. By comparison, the average implementation cost per new EBF acceptor was $10 in Madagascar.

7. Discussion and Conclusions

7.1. Review of Key Research Questions

Review of the cost data and cost effectiveness ratios allows us to answer some key questions about LINKAGES' work:

- *How do costs and outcomes compare across the study regions?*
  Comparing costs on a per beneficiary basis (defined as the total population of the program areas), there appears to be a positive relationship between costs and behavior change outcomes.

- *What are the determinants of costs and cost effectiveness across the study regions?*
  The cost of training activities and mass media are the key cost drivers, and explain the largest differences in the cost structure between the two regions. The relationship between the size of the target population and cost effectiveness is not completely clear, which may be because economies of scale are not great for behavior change, or because the size of the target population exceeded the threshold for which economies can be realized. The data is mixed on whether the baseline rate of the targeted behavior impacts cost effectiveness.

- *What would it cost to replicate these activities in Madagascar and is it cost effective?*
  The cost of replicating LINKAGES and partner activities to promote EBF, TIBF, and LAM is $6.23 per targeted child. The cost per beneficiary for this set of activities is $0.37. For the complete package of LINKAGES' activities aimed at improving all six indicators, the cost per beneficiary is $0.56. The costs per new EBF, TIBF, and LAM acceptor are $10.09, $2.33 and $4.44, respectively.

- *How can LINKAGES improve its cost effectiveness?*
  LINKAGES may be able to improve its cost effectiveness by selecting areas with large target populations and low rates of the targeted behaviors. More data and further analysis of the impact of the mix of activities, and the economies of scale associated with this type of behavior change is needed to better inform cost effective program design.

- *How does the cost effectiveness of the interventions in Madagascar compare with other infant and young child feeding interventions?*
  Although comparable studies are limited, LINKAGES breastfeeding promotion interventions in Madagascar appear to be cost effective at an average cost per new EBF acceptor of $10, compared with data from Brazil showing cost per new EBF acceptor to be $59, and data from Ghana showing cost per new acceptor to be $34.

7.2. Additional Research Questions

While this study provided data that will be useful in shaping future activities, there are nonetheless many other important questions that could shape future activities that have not been addressed:

- What is the impact of each of the individual activities?
- What is the optimal mix of activities?
- What is the level of input required for specific activities, given program parameters such as target population, population density?
- How does the scale and scope of the program impact cost effectiveness?
- How sustainable is the behavior change?

This study was not designed to determine the cost effectiveness of specific activities, but of the package of LINKAGES and partner activities. While it has been demonstrated that this package of LINKAGES activities produces behavior change and is cost effective, we are unable to determine whether all of the activities LINKAGES conducted were necessary or whether the outcomes could have been achieved by undertaking just one, or some limited combination, of these activities. Although LINKAGES appears to be cost effective, without more information on the optimal mix of activities, we cannot determine how LINKAGES can be *most* cost effective.

The data from Madagascar alone cannot confirm significant economies of scale for these programs, but when reviewed in conjunction with data from the LINKAGES program in Ghana, there do appear to be economies of scale and scope. That is, both the size of the program or the size of the population covered (scale), and the range of the behaviors targeted (scope) positively impact cost effectiveness. However, it also appears that economies of scale diminish beyond a certain threshold of population size. Further research to determine that threshold and to explore the activities required beyond that threshold would be helpful to improving cost effectiveness.

The scale and scope of the program in Madagascar may also impact cost effectiveness in other ways. By working across so many districts and covering such a large population, LINKAGES is less able to choose its partners and influence the detailed design of their activities, and is less aware of qualitative factors that impact cost effectiveness (for example, a particularly motivated district coordinator, or the exact timing of activities). While such a large scale integrated program seems to be a cost effective model overall, it makes it more difficult to compare or influence cost effectiveness across districts or regions. These external factors, which this study does not capture, are difficult to control and may impact the cost effectiveness outcomes.

Lastly, the sustainability or longevity of LINKAGES interventions is a key question affecting how we analyze cost effectiveness. This point can be viewed in two ways:

1. *How long would the activities conducted during this study period continue to affect EBF and TIBF behavior?* That is, if LINKAGES had discontinued all activities at the end of the study period, would all new behavior have ceased? Because this scenario seems unlikely, to some extent we are underestimating cost effectiveness because the costs incurred during the study period are producing outcomes beyond the end of the study period. Nonetheless, we have no data about how long these effects would continue within the scope of this study.

2. *At what point do the behaviors become self sustainable?* That is, after some period of time, one may expect that the behaviors encouraged by these interventions would become cultural norms to be passed on within the community. If we could determine how long it takes for these types of behaviors to become cultural norms, then we would have a more accurate measure of cost effectiveness, because we could then measure the total input required to produce long term benefits from these interventions.

Some of these questions may be addressed by comparing cost effectiveness of LINKAGES' interventions across countries, and by extending the period of study. A comparison of the findings from Madagascar and Ghana, will be completed in 2004, and a follow-on study in Madagascar extending the study period is under consideration.

7.3. Implications for the Future

LINKAGES' interventions in Madagascar appear to be cost effective compared with Ghana and Brazil. While Brazil was a very different program model, the interventions to Madagascar have many similarities with Ghana. Additional work to explore thoroughly the factors that create differences in cost effectiveness between these two LINKAGES countries will inform future program design. A follow-on to this study using data from the period November 2001 to October 2002 is under consideration, which could inform the sustainability and longevity questions as that was a period when activities were largely scaled back.

Due to differences in measurement of outcomes, program structure, and administrative requirements, it is difficult (and may be unfair) to compare this intervention with other breastfeeding promotion or child survival activities. For example, the cost structure under a USAID contract, with its reporting, administrative and procurement requirements, cannot be compared to costs of a program funded by a community based NGO. Because it is difficult to eliminate precisely the effect of such management requirements, applying the methodology used in this study to analyze cost effectiveness of other USAID child survival interventions would provide the most accurate assessment of LINKAGES' cost effectiveness. Ability to make comparisons between child survival interventions would also be contingent on ability to convert behaviorial and other outcomes to a common health impact indicator (such as DALYs) reliably. Absent such conditions, comparisons of cost effectiveness are inexact and each intervention must be assessed on its own merits.

Annex A: List of All LINKAGES Activities

ACTIVITIES	Costs Included in this Study
POLICY AND ADVOCACY	
GAIN	N
PROFILES	N
Mass media	Y
IEC materials	Y
Baby-Friendly Hospital Initiative (BFHI)	Y
Baby-Friendly Workplaces	Y
Study Tours	N
Curriculum development for pre-service training	N
CAPACITY BUILDING/TRAINING	
District-level training of trainers workshops	Y
Health workers and NGO training workshops	Y
Community-level trainings, including women's groups	Y
PSI training workshops	Y
Regional LAM Workshops	Y
COMMUNITY MOBILIZATION	
Festivals (health festivals, Community Champion festivals)	Y
Breastfeeding week	Y
OTHER ACTIVITIES	
Supervision	Y
Support to partner IMCI activities	Y
Support to Vitamin A campaign	Y
MONITORING AND EVALUATION	
2000 Baseline survey (LINKAGES/JSI)	Y
2000 LINKAGES Rapid Assessment	Y
2001 LINKAGES Rapid Assessment	Y

Y – cost of activity was included in this study.
N – cost of activity was excluded from this study as it did not directly promote targeted behaviors in the communities studied.

Annex B: Detailed Cost Data

SUMMARY OF LINKAGES AND PARTNER COSTS -- Antananarivo
all costs in US Dollars

PARTNER/Activity	EBF	TIBF	LAM	CF	FSC	MN	Total
LINKAGES							
GF Training	93,059	18,706	33,762	58,993	22,690	993	228,204
Health Worker Training	1,822	176	368	1,646	352	192	4,554
PSI Training	21,484	619	30,426	11,908	217	2,745	67,399
TN Trainings	1,414	472	683	3,053	1,950	578	8,150
BFHI	26,225	4,035	4,035	0	2,017	0	36,311
Festivals, BF Week, Comm Champ	9,104	4,336	256	1,752	256	648	16,352
Mass Media	21,590	2,274	12,408	4,439	3,745	2,206	46,661
RAP/M&E	8,472	1,724	5,737	9,192	1,827	1,827	28,779
IEC	11,332	2,738	5,633	7,503	1,518	2,574	31,299
Miscellaneous	3,281	316	4,338	1,093	2,049	77	11,154
TOTAL	**197,783**	**35,394**	**97,644**	**99,580**	**36,622**	**11,841**	**478,864**
MOH							
Training	164	17	44	156	33	147	562
Admin/Management	93	93	93	93	185	93	652
Services & Sensitization	2,185	330	809	3,375	2,770	826	10,296
Supervision	38	10	22	37	34	26	166
TOTAL	**2,481**	**450**	**968**	**3,661**	**3,023**	**1,092**	**11,676**
AAPS							
LINKAGES - GF Training	6,860	1,343	2,343	7,160	1,782	1,513	21,001
LINKAGES - Health Worker Training	2,475	314	469	7,098	605	2,127	13,088
JSI Training	63	0	1,298	0	1,134	0	2,496
Festival, BF Week, Comm Champ	1,144	686	0	366	0	137	2,333
Supervision	109	105	328	0	199	90	830
TOTAL	**10,651**	**2,447**	**4,438**	**14,624**	**3,720**	**3,867**	**39,748**
JSI							
JSI Training	260	13	2,153	0	1,971	0	4,398
Festivals, BF Week, Comm Champ	3,036	1,822	0	972	0	364	6,194
Supervision	45	45	90	0	74	45	300
LAM	117	7	16	59	39	12	250
Mass Media	33	0	0	0	33	0	66
IEC	564	131	200	104	1,239	164	2,401
TOTAL	**4,056**	**2,018**	**2,459**	**1,134**	**3,357**	**585**	**13,609**
ALL PARTNER COSTS							
LINKAGES - GF Training	6,860	1,343	2,343	7,160	1,782	1,513	21,001
LINKAGES - Health Worker Training	2,639	331	514	7,253	639	2,274	13,650
JSI Training	324	13	3,451	0	3,106	0	6,893
Festival, BF Week, Comm Champ	4,180	2,508	0	1,338	0	502	8,528
Admin/Management	93	93	93	93	185	93	652
Services & Sensitization	2,185	330	809	3,375	2,770	826	10,296
Supervision	193	160	440	37	307	160	1,296
LAM	117	7	16	59	39	12	250
Mass Media	33	0	0	0	33	0	66
IEC	564	131	200	104	1,239	164	2,401
TOTAL	**17,188**	**4,915**	**7,865**	**19,419**	**10,100**	**5,545**	**65,033**
LINKAGES AND ALL PARTNERS							
LINKAGES - GF Training	99,919	20,049	36,105	66,153	24,472	2,506	249,205
LINKAGES - Health Worker Training	4,461	507	881	8,900	990	2,466	18,205
PSI Training	21,484	619	30,426	11,908	217	2,745	67,399
TN Trainings	1,414	472	683	3,053	1,950	578	8,150
JSI Training	324	13	3,451	0	3,106	0	6,893
BFHI	26,225	4,035	4,035	0	2,017	0	36,311
Festivals, BF Week, Comm Champ	13,284	6,844	256	3,090	256	1,150	24,880
Mass Media	21,623	2,274	12,408	4,439	3,778	2,206	46,727
RAP/M&E	8,472	1,724	5,737	9,192	1,827	1,827	28,779
IEC	11,896	2,868	5,833	7,607	2,757	2,739	33,701
Services & Sensitization	2,185	330	809	3,375	2,770	826	10,296
Admin/Mgmt & Supervision	286	253	533	130	492	254	1,948
Miscellaneous	3,398	323	4,354	1,152	2,089	89	11,404
TOTAL	**214,971**	**40,310**	**105,510**	**118,999**	**46,722**	**17,386**	**543,897**
% of Total	40%	7%	19%	22%	9%	3%	100%

SUMMARY OF LINKAGES AND PARTNER COSTS -- Fianarantsoa

all costs in US Dollars

PARTNER/Activity	EBF	TIBF	LAM	CF	FSC	MN	Total
LINKAGES							
GF Training	85,411	17,363	33,089	26,877	18,804	689	182,234
Health Worker Training	2,306	377	742	2,503	433	421	6,782
PSI Training	5,006	336	6,271	166	258	266	12,303
TN Trainings	1,679	857	1,026	2,922	2,040	942	9,464
BFHI	18,447	2,838	2,838	0	1,419	0	25,542
Festivals, BF Week, Comm Champ	4,343	1,705	205	461	205	166	7,084
Mass Media	28,852	2,920	13,470	3,759	3,378	1,765	54,143
RAP/M&E	6,777	1,380	4,590	7,354	1,461	1,461	23,023
IEC	9,066	2,190	4,506	6,003	1,215	2,060	25,039
Miscellaneous	1,653	286	3,876	597	1,222	64	7,699
RAP/M&E	**163,541**	**30,251**	**70,612**	**50,641**	**30,435**	**7,834**	**353,312**
MOH							
Training	145	16	40	227	27	263	718
Admin/Management	70	70	70	70	70	70	421
Services & Sensitization	1,234	246	514	1,533	1,327	709	5,564
Supervision	16	2	12	20	34	20	104
TOTAL	**1,466**	**333**	**637**	**1,851**	**1,458**	**1,062**	**6,807**
AAPS							
LINKAGES - GF Training	7,509	1,053	1,687	9,755	1,574	640	22,217
LINKAGES - Health Worker Training	1,308	91	201	1,170	261	115	3,146
JSI Training	46	0	508	0	378	0	931
Festival, BF Week, Comm Champ	882	529	0	282	0	106	1,799
Supervision	63	63	181	0	177	63	546
TOTAL	**9,807**	**1,736**	**2,576**	**11,207**	**2,389**	**923**	**28,638**
JSI							
JSI Training	193	1	1,673	0	1,433	0	3,300
Festivals, BF Week, Comm Champ	1,488	893	0	476	0	179	3,035
Supervision	176	94	191	82	164	62	770
LAM	392	24	55	196	78	39	785
Mass Media	26	0	0	0	26	0	53
IEC	451	105	160	83	991	131	1,921
TOTAL	**2,727**	**1,116**	**2,079**	**837**	**2,693**	**411**	**9,863**
ALL PARTNER COSTS							
LINKAGES - GF Training	7,509	1,053	1,687	9,755	1,574	640	22,217
LINKAGES - Health Worker Training	1,453	107	241	1,398	287	378	3,864
JSI Training	239	1	2,181	0	1,810	0	4,231
Festival, BF Week, Comm Champ	2,369	1,422	0	758	0	284	4,833
Admin/Management	70	70	70	70	70	70	421
Services & Sensitization	1,234	246	514	1,533	1,327	709	5,564
Supervision	255	158	384	102	376	145	1,420
LAM	392	24	55	196	78	39	785
Mass Media	26	0	0	0	26	0	53
IEC	451	105	160	83	991	131	1,921
TOTAL	**14,000**	**3,186**	**5,291**	**13,896**	**6,540**	**2,397**	**45,309**
LINKAGES AND ALL PARTNERS							
LINKAGES - GF Training	92,920	18,416	34,776	36,632	20,377	1,329	204,451
LINKAGES - Health Worker Training	3,759	484	983	3,900	720	799	10,645
PSI Training	5,006	336	6,271	166	258	266	12,303
TN Trainings	1,679	857	1,026	2,922	2,040	942	9,464
JSI Training	239	1	2,181	0	1,810	0	4,231
BFHI	18,447	2,838	2,838	0	1,419	0	25,542
Festivals, BF Week, Comm Champ	6,712	3,126	205	1,219	205	450	11,917
Mass Media	28,878	2,920	13,470	3,759	3,405	1,765	54,196
RAP/M&E	6,777	1,380	4,590	7,354	1,461	1,461	23,023
IEC	9,517	2,295	4,666	6,086	2,206	2,191	26,961
Services & Sensitization	1,234	246	514	1,533	1,327	709	5,564
Admin/Mgmt & Supervision	326	228	454	172	446	215	1,842
Miscellaneous	2,045	309	3,931	793	1,301	104	8,483
TOTAL	**177,541**	**33,436**	**75,903**	**64,536**	**36,975**	**10,230**	**398,621**
% of Total	45%	8%	19%	16%	9%	3%	100%

COST OF ACTIVITIES IN EACH REGION, ALLOCATED BY INDICATOR (Partner Costs)

	Antananarivo			Fianarantsoa			Total	
Pop Covered (at Oct '01)	**1,197,521**			**638,530**			**1,836,051**	
Pop Covered (Sep '00)	**575,060**			**259,282**			**834,342**	
Avg No. of Beneficiaries	**886,291**			**448,906**			**1,335,197**	
INDICATOR	**Cost**	**Per Beneficiary**	**% Chg in Indicator**	**Cost**	**Per Beneficiary**	**% Chg in Indicator**	**Cost**	**Per Beneficiary**
EBF	17,188	$0.02	38%	14,000	$0.03	36%	31,188	$0.02
TIBF	4,915	$0.01	21%	3,186	$0.01	54%	8,101	$0.01
LAM	7,865	$0.01	29%	5,291	$0.01	58%	13,157	$0.01
CF	19,419	$0.02	30%	13,896	$0.03	49%	33,315	$0.02
FSC	10,100	$0.01	14%	6,540	$0.01	15%	16,640	$0.01
MN	5,545	$0.01	73%	2,397	$0.01	51%	7,942	$0.01
TOTAL	**65,033**	**$0.07**		**45,309**	**$0.10**		**110,342**	**$0.08**

COST OF ACTIVITIES IN EACH REGION, ALLOCATED BY INDICATOR (LINKAGES & Partner Costs)

	Antananarivo			Fianarantsoa			Total	
Pop Covered (at Oct '01)	**1,197,521**			**638,530**			**1,836,051**	
Pop Covered (Sep '00)	**575,060**			**259,282**			**834,342**	
Avg No. of Beneficiaries	**886,291**			**448,906**			**1,335,197**	
INDICATOR	**Cost**	**Per Beneficiary**	**% Chg in Indicator**	**Cost**	**Per Beneficiary**	**% Chg in Indicator**	**Cost**	**Per Beneficiary**
EBF	214,971	$0.24	38%	177,541	$0.40	36%	392,512	$0.29
TIBF	40,310	$0.05	21%	33,436	$0.07	54%	73,746	$0.06
LAM	105,510	$0.12	29%	75,903	$0.17	58%	181,413	$0.14
CF	118,999	$0.13	30%	64,536	$0.14	49%	183,535	$0.14
FSC	46,722	$0.05	14%	36,975	$0.08	15%	83,696	$0.06
MN	17,386	$0.02	73%	10,230	$0.02	51%	27,616	$0.02
TOTAL	**543,897**	**$0.61**		**398,621**	**$0.89**		**942,519**	**$0.71**

COST EFECTIVENESS RATIOS BY REGION (LINKAGES & Partner Costs)

	ANTANANARIVO						FIANARANTSOA					TOTAL		
INDICATOR	**Age Group as Percent of**	**Total Cost by Indicator**	**Percent Change in Indicator**	**Target Population**	**Number of New Acceptors**	**Cost per New Acceptor**	**Total Cost by Indicator**	**Percent Change in Indicator**	**Target Population**	**Number of New Acceptors**	**Cost per New Acceptor**	**Percent Change in Indicator**	**Number of New Acceptors**	**Cost per New Acceptor**
EBF (0-5 months)	1.68%	214,971	38%	52,859	20,087	**$10.70**	177,541	36%	26,594	9,574	**$18.54**	37%	29,660	**$13.23**
TIBF (0-5 months)	1.68%	40,310	21%	52,859	11,100	**$3.63**	33,436	54%	26,594	14,361	**$2.33**	35%	25,461	**$2.90**
LAM (0-5 months)	1.68%	105,510	29%	52,859	15,329	**$6.88**	75,903	58%	26,594	15,425	**$4.92**	32%	30,754	**$5.90**
CF (6-23 months)	5.46%	118,999	30%	72,355	21,707	**$5.48**	64,536	49%	38,007	18,623	**$3.47**	38%	40,330	**$4.55**
FSC (0-24 months)	7.14%	46,722	14%	85,503	11,970	**$3.90**	36,975	15%	45,591	6,839	**$5.41**	15%	18,809	**$4.45**
MN (0-11 months)	3.68%	17,386	73%	58,184	42,474	**$0.41**	10,230	51%	29,862	15,230	**$0.67**	64%	57,704	**$0.48**

SUMMARY OF LINKAGES COSTS

FULL COST OF ACTIVITIES CONTRIBUTING TO 6 KEY INDICATORS

ACTIVITIES	Alloc Staff &	Direct Staff	Other	DC Consult	Alloc DC	TOTAL
GF Training	173,653	8,414	137,166	0	224,293	543,527
Health Worker Training	6,416	865	5,068	0	8,287	20,636
PSI Training	28,208	1,482	22,281	0	36,433	88,404
TN Trainings	7,643	309	6,037	0	9,872	23,861
BFHI	25,454	2,810	20,106	14,257	32,877	95,503
Festivals, BF Week, Comm Champ	10,502	1,698	8,296	0	13,565	34,062
Mass Media	44,771	6,945	35,364	0	57,827	144,906
RAP/M&E	25,688	0	20,290	5,422	33,178	84,578
IEC	21,582	0	17,047	3,564	27,875	70,068
Miscellaneous	3,758	4,155	2,968	8,602	4,854	24,336
TOTAL	**347,675**	**26,678**	**274,623**	**31,845**	**449,060**	**1,129,880**

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
GF Training	56,386	43,892	53,231	72,925	23,264	67,474	21,528	47,900	41,784	428,383
Health Worker Training	1,098	2,562	2,974	871	301	3,177	104	570	276	11,933
PSI Training	0	0	11,547	1,118	11,662	643	25,390	14,195	15,992	80,547
TN Trainings	2,186	3,313	2,192	2,249	2,851	2,083	1,355	1,450	1,515	19,193
BFHI	5,756	6,387	12,353	6,338	9,708	6,529	9,953	5,928	5,775	68,726
Festivals, BF Week, Comm Champ	3,341	2,054	1,796	1,807	1,312	2,968	11,496	1,736	1,312	27,821
Mass Media	9,456	13,266	9,710	9,727	18,791	14,002	9,456	9,456	9,456	103,321
RAP/M&E	6,080	6,080	6,080	6,080	6,080	6,080	6,080	6,080	6,080	54,722
IEC	6,406	6,406	6,406	6,406	6,406	6,406	6,406	6,406	6,406	57,651
Miscellaneous	1,606	2,814	4,010	1,729	2,466	1,702	1,606	2,645	1,606	20,183
TOTAL	**92,315**	**86,774**	**110,297**	**109,248**	**82,840**	**111,065**	**93,374**	**96,365**	**90,201**	**872,480**

COST OF EACH ACTIVITY BY REGION

ACTIVITIES	Antananarivo	Fianarantsoa	Total
GF Training	237,367	191,016	428,383
Health Worker Training	4,794	7,138	11,933
PSI Training	68,242	12,305	80,547
TN Trainings	8,761	10,432	19,193
BFHI	40,346	28,380	68,726
Festivals, BF Week, Comm Champ	18,146	9,674	27,821
Mass Media	47,806	55,515	103,321
RAP/M&E	30,401	24,321	54,722
IEC	32,028	25,623	57,651
Miscellaneous	11,595	8,588	20,183
TOTAL	**499,486**	**372,993**	**872,480**

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS -- EBF

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
GF Training	24,630	16,031	24,058	30,190	11,585	33,165	5,941	14,589	18,282	178,471
Health Worker Training	549	1,281	1,265	435	150	325	30	53	38	4,128
PSI Training	0	0	3,164	264	4,745	262	8,935	4,019	5,102	26,490
TN Trainings	352	532	353	362	459	336	219	234	245	3,092
BFHI	3,741	4,152	8,029	4,119	6,310	4,244	6,469	3,853	3,754	44,672
Festivals, BF Week, Comm Champ	1,436	1,018	861	861	861	1,028	5,661	861	861	13,447
Mass Media	4,266	7,233	4,392	4,401	10,930	6,423	4,266	4,266	4,266	50,442
RAP/M&E	1,694	1,694	1,694	1,694	1,694	1,694	1,694	1,694	1,694	15,249
IEC	2,266	2,266	2,266	2,266	2,266	2,266	2,266	2,266	2,266	20,398
Miscellaneous	321	502	1,755	355	493	336	321	529	321	4,934
TOTAL	**39,256**	**34,711**	**47,838**	**44,949**	**39,493**	**50,081**	**35,803**	**32,365**	**36,829**	**361,324**

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS -- TIBF

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
GF Training	5,152	3,124	4,884	6,354	2,326	6,761	1,180	2,696	3,592	36,069
Health Worker Training	33	252	123	32	24	67	3	12	6	553
PSI Training	0	0	370	10	318	18	70	95	74	955
TN Trainings	155	313	156	164	248	141	39	52	61	1,328
BFHI	576	639	1,235	634	971	653	995	593	577	6,873
Festivals, BF Week, Comm Champ	636	386	291	291	291	392	3,171	291	291	6,041
Mass Media	444	648	470	471	936	891	444	444	444	5,194
RAP/M&E	345	345	345	345	345	345	345	345	345	3,104
IEC	548	548	548	548	548	548	548	548	548	4,928
Miscellaneous	12	72	243	17	184	19	12	32	12	602
TOTAL	**7,900**	**6,326**	**8,665**	**8,866**	**6,191**	**9,833**	**6,806**	**5,108**	**5,950**	**65,645**

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS -- LAM

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
GF Training	9,616	5,497	9,340	11,565	4,637	13,339	1,697	4,283	6,877	66,851
Health Worker Training	77	505	261	72	49	110	5	19	10	1,109
PSI Training	0	0	3,506	373	5,943	328	13,246	5,815	7,486	36,696
TN Trainings	197	355	198	206	290	183	81	94	103	1,708
BFHI	576	639	1,235	634	971	653	995	593	577	6,873
Festivals, BF Week, Comm Champ	51	51	51	51	51	51	51	51	51	461
Mass Media	2,461	3,045	2,511	2,515	4,357	3,607	2,461	2,461	2,461	25,878
RAP/M&E	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	10,326
IEC	1,127	1,127	1,127	1,127	1,127	1,127	1,127	1,127	1,127	10,139
Miscellaneous	821	882	1,048	825	1,337	835	821	821	821	8,214
TOTAL	**16,073**	**13,249**	**20,425**	**18,515**	**19,910**	**21,380**	**21,632**	**16,411**	**20,662**	**168,256**

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS -- CF

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
GF Training	8,300	13,591	7,062	13,711	1,207	3,780	10,074	20,888	7,259	85,870
Health Worker Training	275	139	854	201	32	2,058	48	374	169	4,149
PSI Training	0	0	3,192	366	158	9	2,441	3,319	2,590	12,075
TN Trainings	671	829	672	680	764	657	555	568	577	5,974
BFHI	0	0	0	0	0	0	0	0	0	0
Festivals, BF Week, Comm Champ	227	94	43	43	43	97	1,579	43	43	2,213
Mass Media	882	896	895	896	899	1,081	882	882	882	8,197
RAP/M&E	1,838	1,838	1,838	1,838	1,838	1,838	1,838	1,838	1,838	16,546
IEC	1,501	1,501	1,501	1,501	1,501	1,501	1,501	1,501	1,501	13,506
Miscellaneous	133	194	188	162	133	137	133	476	133	1,690
TOTAL	**13,828**	**19,081**	**16,246**	**19,399**	**6,575**	**11,157**	**19,052**	**29,890**	**14,992**	**150,220**

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS -- FSC

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
GF Training	5,601	4,095	5,251	7,184	2,329	6,779	1,943	4,278	4,034	41,494
Health Worker Training	110	256	248	87	30	37	5	5	5	785
PSI Training	0	0	217	0	244	13	0	0	0	474
TN Trainings	451	609	452	460	544	436	335	348	357	3,990
BFHI	288	319	618	317	485	326	498	296	289	3,436
Festivals, BF Week, Comm Champ	51	51	51	51	51	51	51	51	51	461
Mass Media	738	765	764	766	738	1,136	738	738	738	7,123
RAP/M&E	365	365	365	365	365	365	365	365	365	3,288
IEC	304	304	304	304	304	304	304	304	304	2,733
Miscellaneous	289	350	442	324	289	293	289	705	289	3,272
TOTAL	**8,197**	**7,114**	**8,711**	**9,857**	**5,381**	**9,742**	**4,529**	**7,092**	**6,434**	**67,057**

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS -- MN

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
GF Training	390	103	184	588	12	184	154	54	12	1,682
Health Worker Training	0	0	74	0	0	421	7	77	33	613
PSI Training	0	0	878	78	252	14	523	711	555	3,011
TN Trainings	176	334	177	185	270	162	60	73	82	1,521
BFHI	0	0	0	0	0	0	0	0	0	0
Festivals, BF Week, Comm Champ	83	33	14	14	14	35	590	14	14	814
Mass Media	441	441	441	441	441	441	441	441	441	3,970
RAP/M&E	365	365	365	365	365	365	365	365	365	3,288
IEC	515	515	515	515	515	515	515	515	515	4,634
Miscellaneous	0	60	69	8	0	4	0	0	0	142
TOTAL	**1,971**	**1,852**	**2,718**	**2,196**	**1,869**	**2,141**	**2,657**	**2,252**	**2,019**	**19,675**

COST OF ACTIVITIES BY REGION, ALLOCATED BY INDICATOR

	Antananarivo			Fianarantsoa		
Total Beneficiaries	**886,291**			**448,906**		
INDICATOR	**Cost**	**Per Beneficiary**	**% Chg in Indicator**	**Cost**	**Per Beneficiary**	**% Chg in Indicator**
EBF	197,783	$0.22	38%	163,541	$0.36	36%
TIBF	35,394	$0.04	21%	30,251	$0.07	54%
LAM	97,644	$0.11	29%	70,612	$0.16	58%
CF	99,580	$0.11	30%	50,641	$0.11	49%
FSC	36,622	$0.04	14%	30,435	$0.07	15%
MN	11,841	$0.01	73%	7,834	$0.02	51%
TOTAL	**478,864**	**$0.54**		**353,312**	**$0.79**	

SUMMARY OF JSI COSTS

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS

ACTIVITIES	Ambohimahasa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
JSI Training	653	872	684	662	796	979	1,067	1,018	968	7,698
Festivals, BF Week, Comm Cham	1,813	947	2,352	3,375	90	185	146	26	295	9,229
Supervision	216	312	108	20	150	92	121	66	0	1,086
LAM	0	0	0	80	0	785	95	29	31	1,019
Mass Media	13	13	13	13	13	13	13	13	13	118
IEC Materials	480	480	480	480	480	480	480	480	480	4,323
TOTAL	**3.175**	**2.624**	**3.638**	**4.631**	**1.529**	**2.535**	**1.922**	**1.631**	**1.787**	**23.473**

FULL COST OF EACH ACTIVITY BY REGION

ACTIVITIES	Antananarivo	Fianarantsoa	Total
JSI Training	4,398	3,300	7,698
Festivals. BF Week. Comm Cham	6,194	3,035	9,229
Supervision	316	770	1,086
LAM	234	785	1,019
Mass Media	66	53	118
IEC Materials	2,401	1,921	4,323
TOTAL	**13,609**	**9,863**	**23,473**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- EBF

ACTIVITIES	Ambohimahasa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
JSI Training	30	72	22	44	32	60	116	38	40	454
Festivals. BF Week. Comm Cham	889	464	1,153	1,655	44	91	72	13	145	4,524
Supervision	36	106	15	3	21	13	17	9	0	221
LAM	0	0	0	40	0	392	47	14	16	509
Mass Media	7	7	7	7	7	7	7	7	7	59
IEC Materials	113	113	113	113	113	113	113	113	113	1,015
TOTAL	**1,074**	**761**	**1,310**	**1,861**	**217**	**675**	**372**	**194**	**320**	**6,783**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- TIBF

ACTIVITIES	Ambohimahasa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
JSI Training	0	0	0	0	0	1	12	1	0	14
Festivals, BF Week, Comm Cham	533	279	692	993	26	55	43	8	87	2,714
Supervision	33	26	15	3	21	13	17	9	0	139
LAM	0	0	0	2	0	24	3	1	1	31
Mass Media	0	0	0	0	0	0	0	0	0	0
IEC Materials	26	26	26	26	26	26	26	26	26	236
TOTAL	**592**	**331**	**733**	**1,024**	**74**	**119**	**101**	**45**	**114**	**3,134**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- LAM

ACTIVITIES	Ambohimahasa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
JSI Training	313	458	357	308	408	494	468	570	450	3,826
Festivals, BF Week, Comm Cham	0	0	0	0	0	0	0	0	0	0
Supervision	72	50	31	6	43	26	35	19	0	282
LAM	0	0	0	6	0	55	7	2	2	71
Mass Media	0	0	0	0	0	0	0	0	0	0
IEC Materials	40	40	40	40	40	40	40	40	40	359
TOTAL	**424**	**548**	**428**	**359**	**491**	**615**	**549**	**631**	**492**	**4,538**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- CF

ACTIVITIES	Ambohimahasa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
JSI Training	0	0	0	0	0	0	0	0	0	0
Festivals. BF Week. Comm Cham	284	149	369	529	14	29	23	4	46	1,448
Supervision	0	82	0	0	0	0	0	0	0	82
LAM	0	0	0	20	0	196	24	7	8	255
Mass Media	0	0	0	0	0	0	0	0	0	0
IEC Materials	21	21	21	21	21	21	21	21	21	187
TOTAL	**305**	**251**	**390**	**570**	**35**	**246**	**67**	**32**	**75**	**1,972**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- FSC

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
JSI Training	311	342	305	310	356	424	470	409	478	3,404
Festivals. BF Week. Comm Cham	0	0	0	0	0	0	0	0	0	0
Supervision	56	40	31	6	43	26	35	3	0	239
LAM	0	0	0	8	0	78	9	19	3	118
Mass Media	7	7	7	7	7	7	7	7	7	59
IEC Materials	248	248	248	248	248	248	248	248	248	2,230
TOTAL	**621**	**636**	**590**	**578**	**653**	**783**	**769**	**685**	**735**	**6,050**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- MN

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
JSI Training	0	0	0	0	0	0	0	0	0	0
Festivals, BF Week, Comm Cham	107	56	138	199	5	11	9	2	17	543
Supervision	20	8	15	3	21	13	17	9	0	107
LAM	0	0	0	4	0	39	5	1	2	51
Mass Media	0	0	0	0	0	0	0	0	0	0
IEC Materials	33	33	33	33	33	33	33	33	33	296
TOTAL	**159**	**96**	**187**	**238**	**60**	**96**	**64**	**45**	**52**	**997**

COST OF ACTIVITIES IN EACH DISTRICT, ALLOCATED BY INDICATOR

INDICATOR	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
EBF	1,074	761	1,310	1,861	217	675	372	194	320	6,783
TIBF	592	331	733	1,024	74	119	101	45	114	3,134
LAM	424	548	428	359	491	615	549	631	492	4,538
CF	305	251	390	570	35	246	67	32	75	1,972
FSC	621	636	590	578	653	783	769	685	735	6,050
MN	159	96	187	238	60	96	64	45	52	997
TOTAL	**3,175**	**2,624**	**3,638**	**4,631**	**1,529**	**2,535**	**1,922**	**1,631**	**1,787**	**23,473**

COST OF ACTIVITIES BY REGION, ALLOCATED BY INDICATOR

INDICATOR	Tana	Fiana	Total
EBF	4,056	2,727	6,783
TIBF	2,018	1,116	3,134
LAM	2,459	2,079	4,538
CF	1,134	837	1,972
FSC	3,357	2,693	6,050
MN	585	411	997
TOTAL	**13,609**	**9,863**	**23,473**

SUMMARY OF AAPS COSTS

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS

ACTIVITIES	Ambohimahasoa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
LINKAGES - GF Trainings	2,300	9,422	3,833	7,493	5,564	4,930	5,370	2,358	1,947	43,218
LINKAGES - Health worker training	0	1,174	1,260	2,575	727	1,239	3,383	4,914	956	16,227
JSI Training	327	66	506	765	35	510	334	306	585	3,433
Festival, BF Week, Comm Champ	156	78	467	0	856	710	700	622	544	4,132
Supervision	115	317	75	260	17	97	207	242	46	1,376
TOTAL	**2,898**	**11,056**	**6,141**	**11,092**	**7,198**	**7,486**	**9,995**	**8,443**	**4,078**	**68,387**

FULL COST OF EACH ACTIVITY BY REGION

ACTIVITIES	Antananarivo	Fianarantsoa	Total
LINKAGES - GF Trainings	21,001	22,217	43,218
LINKAGES - Health worker training	13,088	3,139	16,227
JSI Training	2,496	938	3,433
Festival, BF Week, Comm Champ	2,333	1,799	4,132
Supervision	830	546	1,376
TOTAL	**39,748**	**28,638**	**68,387**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- EBF

ACTIVITIES	Ambohimahasoa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
LINKAGES - GF Trainings	949	5,139	1,464	1,871	309	1,113	2,054	768	704	14,369
LINKAGES - Health worker training	0	618	79	136	38	652	458	1,752	50	3,783
JSI Training	7	18	33	19	7	14	4	8	0	109
Festival, BF Week, Comm Champ	76	38	229	0	419	348	343	305	267	2,026
Supervision	16	30	15	37	2	14	13	35	10	172
TOTAL	**1,047**	**5,843**	**1,819**	**2,062**	**776**	**2,140**	**2,872**	**2,867**	**1,031**	**20,458**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- TIBF

ACTIVITIES	Ambohimahasoa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
LINKAGES - GF Trainings	183	498	328	320	124	249	415	148	132	2,396
LINKAGES - Health worker training	0	37	32	54	15	39	71	137	20	405
JSI Training	0	0	0	0	0	0	0	0	0	0
Festival, BF Week, Comm Champ	46	23	137	0	252	209	206	183	160	1,215
Supervision	16	30	15	37	2	14	13	35	5	167
TOTAL	**245**	**588**	**512**	**411**	**393**	**510**	**705**	**502**	**317**	**4,184**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- LAM

ACTIVITIES	Ambohimahasoa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
LINKAGES - GF Trainings	338	896	649	428	0	453	784	254	228	4,030
LINKAGES - Health worker training	0	86	47	81	23	91	22	288	30	670
JSI Training	195	14	240	380	17	282	187	160	330	1,806
Festival, BF Week, Comm Champ	0	0	0	0	0	0	0	0	0	0
Supervision	35	113	30	74	5	28	144	69	10	509
TOTAL	**568**	**1,110**	**967**	**964**	**45**	**854**	**1,138**	**772**	**599**	**7,014**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- CF

ACTIVITIES	Ambohimahasoa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
LINKAGES - GF Trainings	606	2,055	470	4,308	4,637	2,457	878	780	724	16,915
LINKAGES - Health worker training	0	309	231	1,897	535	326	2,139	2,127	704	8,268
JSI Training	0	0	0	0	0	0	0	0	0	0
Festival, BF Week, Comm Champ	24	12	73	0	134	111	110	98	85	648
Supervision	0	0	0	0	0	0	0	0	0	0
TOTAL	**631**	**2,376**	**774**	**6,205**	**5,307**	**2,894**	**3,126**	**3,004**	**1,514**	**25,831**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- FSC

ACTIVITIES	Ambohimahasoa	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
LINKAGES - GF Trainings	224	643	441	500	495	211	478	204	159	3,355
LINKAGES - Health worker training	7	124	27	0	0	130	247	332	0	866
JSI Training	119	33	233	365	11	215	142	138	255	1,512
Festival, BF Week, Comm Champ	0	0	0	0	0	0	0	0	0	0
Supervision	32	113	15	74	5	28	25	69	15	376
TOTAL	**382**	**913**	**716**	**940**	**511**	**584**	**892**	**743**	**429**	**6,109**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- MN

ACTIVITIES	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
LINKAGES - GF Trainings	0	192	481	66	0	448	761	205	0	2,153
LINKAGES - Health worker training	0	0	844	407	115	0	447	278	151	2,242
JSI Training	0	0	0	0	0	0	0	0	0	0
Festival, BF Week, Comm Champ	9	5	27	0	50	42	41	37	32	243
Supervision	16	30	0	37	2	14	13	35	5	152
TOTAL	**25**	**227**	**1,353**	**510**	**167**	**504**	**1,262**	**555**	**188**	**4,790**

COST OF ACTIVITIES IN EACH DISTRICT, ALLOCATED BY INDICATOR

INDICATOR	Ambohimaha	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
EBF	1,047	5,843	1,819	2,062	776	2,140	2,872	2,867	1,031	20,458
TIBF	245	588	512	411	393	510	705	502	317	4,184
LAM	568	1,110	967	964	45	854	1,138	772	599	7,014
CF	631	2,376	774	6,205	5,307	2,894	3,126	3,004	1,514	25,831
FSC	382	913	716	940	511	584	892	743	429	6,109
MN	25	227	1,353	510	167	504	1,262	555	188	4,790
TOTAL	**2,898**	**11,056**	**6,141**	**11,092**	**7,198**	**7,486**	**9,995**	**8,443**	**4,078**	**68,387**

COST OF ACTIVITIES BY REGION, ALLOCATED BY INDICATOR

INDICATOR	Tana	Fiana	Total
EBF	10,651	9,807	20,458
TIBF	2,447	1,736	4,184
LAM	4,438	2,576	7,014
CF	14,624	11,207	25,831
FSC	3,720	2,389	6,109
MN	3,867	923	4,790
TOTAL	**39,748**	**28,638**	**68,387**

SUMMARY OF MOH COSTS

COST OF EACH ACTIVITY ALLOCATED TO STUDY DISTRICTS

ACTIVITIES	Ambohimah	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
Training	120	109	150	235	265	225	79	51	47	1,280
Admin/Management	160	50	27	75	117	93	230	201	118	1,073
Services & Sensitization	1,789	1,607	878	1,859	462	1,705	3,052	1,674	2,833	15,860
Supervision	26	45	8	68	5	28	34	31	25	270
Total	**2,095**	**1,812**	**1,063**	**2,238**	**849**	**2,052**	**3,394**	**1,957**	**3,023**	**18,483**

FULL COST OF EACH ACTIVITY BY REGION

ACTIVITIES	Antananaro	Fianarantso	Total
Training	562	718	1,280
Admin/Management	652	421	1,073
Services & Sensitization	10,296	5,564	15,860
Supervision	166	104	270
Total	**11,676**	**6,807**	**18,483**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- EBF

ACTIVITIES	Ambohimah	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
Training	36	27	39	36	44	37	40	26	23	310
Admin/Management	27	8	4	8	20	16	38	22	20	163
Services & Sensitization	397	355	168	436	100	382	637	355	589	3,419
Supervision	5	5	2	15	1	6	8	6	8	55
Total	**465**	**396**	**214**	**495**	**164**	**441**	**722**	**410**	**639**	**3,947**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- TIBF

ACTIVITIES	Ambohimah	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
Training	4	2	5	3	5	4	4	3	2	33
Admin/Management	27	8	4	8	20	16	38	22	20	163
Services & Sensitization	77	70	19	81	21	78	81	60	89	576
Supervision	0	0	0	8	0	1	0	0	1	11
Total	**108**	**80**	**28**	**101**	**46**	**99**	**124**	**86**	**111**	**784**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- LAM

ACTIVITIES	Ambohimah	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
Training	8	15	11	11	9	9	10	6	6	85
Admin/Management	27	8	4	8	20	16	38	22	20	163
Services & Sensitization	150	153	80	131	45	166	238	127	232	1,323
Supervision	3	5	1	10	1	3	4	4	3	33
Total	**188**	**182**	**96**	**161**	**74**	**192**	**290**	**159**	**261**	**1,605**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- CF

ACTIVITIES	Ambohimah	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
Training	56	49	59	60	67	56	16	10	10	383
Admin/Management	27	8	4	8	20	16	38	22	20	163
Services & Sensitization	513	439	276	585	122	460	1,029	567	918	4,909
Supervision	5	9	2	14	1	6	8	6	7	57
Total	**601**	**505**	**342**	**668**	**209**	**537**	**1,091**	**605**	**955**	**5,512**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- FSC

ACTIVITIES	Ambohimah	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
Training	6	6	8	8	8	7	8	5	5	60
Admin/Management	27	8	4	33	20	16	38	89	20	256
Services & Sensitization	430	377	276	403	116	404	875	433	785	4,097
Supervision	9	15	1	10	1	9	9	11	3	68
Total	**472**	**406**	**290**	**453**	**145**	**435**	**930**	**538**	**812**	**4,481**

COST OF EACH ACTIVITY ALLOCATED TO EACH DISTRICT -- MN

ACTIVITIES	Ambohimah	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
Training	9	9	28	118	132	112	0	0	0	410
Admin/Management	27	8	4	8	20	16	38	22	20	163
Services & Sensitization	223	213	60	223	58	215	192	132	219	1,535
Supervision	3	12	2	11	1	4	6	3	4	46
Total	**262**	**243**	**94**	**360**	**210**	**347**	**237**	**158**	**243**	**2,155**

COST OF ACTIVITIES IN EACH DISTRICT, ALLOCATED BY INDICATOR

INDICATOR	Ambohimah	Ambositra	Antisirabe I	Antisirabe II	Fianara I	Fianara II	Tana Ville	Tana Nord	Tana Sud	TOTAL
EBF	465	396	214	495	164	441	722	410	639	3,947
TIBF	108	80	28	101	46	99	124	86	111	784
LAM	188	182	96	161	74	192	290	159	261	1,605
CF	601	505	342	668	209	537	1,091	605	955	5,512
FSC	472	406	290	453	145	435	930	538	812	4,481
MN	262	243	94	360	210	347	237	158	243	2,155
Total	**2,095**	**1,812**	**1,063**	**2,238**	**849**	**2,052**	**3,394**	**1,957**	**3,023**	**18,483**

COST OF ACTIVITIES BY REGION, ALLOCATED BY INDICATOR

INDICATOR	Tana	Fiana	Total
EBF	2,481	1,466	3,947
TIBF	450	333	784
LAM	968	637	1,605
CF	3,661	1,851	5,512
FSC	3,023	1,458	4,481
MN	1,092	1,062	2,155

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